MOTORAGE

Vol. XLIII Number 10 PUBLISHED WEEKLY AT THE MALLERS BUILDING CHICAGO, MARCH 8, 1923

Thirty-five Cents a Copy Three Dollars a Year



DANGER!

Thousands of good dealers—all good business men will deliver thousands of motor cars this year—and yet lose money.

Four reasons:

Not enough discount.

Too many time sales.

Too much service expense.

Too much loss on second hand cars.

I have the answer.

Are you interested?



BLACK & DECKER HALF-INCH SPECIAL

"With the Pistol Grip and Trigger Switch"



CARRIED IN STOCK BY THE LEADING JOBBERS

This is the standard Black & Decker Half-Inch Special which sold at \$85 in 1922. The demand for this model has been so great that we now have them on a quantity production basis. In spite of the fact that we have been obliged to pay higher prices for raw materials, the continuous production in large quantities enables us to make a saving, and this is being passed on to you.

THE BLACK & DECKER MFG. CO.

Towson Heights :: Baltimore, Md., U. S. A.

BLACK & DECKER SERVICE

The Life of Black & Decker Electric Tools is exceptionally long by reason of their design, the use of the best materials, and their fine workmanship. This long life is further extended by our chain of conveniently located Service Stations.

> NEW TOOL GUARANTEE given on all machines serviced by Black & Decker Service Stations.

Branch Offices and Service Stations Carrying Complete Stocks of Parts Operated by Factory Trained Men Located in

DETROIT CHICAGO CLEVELAND

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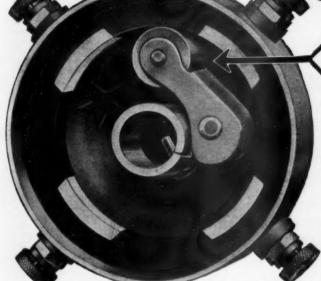




Red Star-Unquestionably

the Most Accurately Made

Timer for FORDS



Perfect Combination of Working Parts

Every part in itself is mechanically correct in design and every part works perfectly with every other part. A proper combination of working parts is vital to the life and success of a timer.

After months of the hardest kind of heavy duty the Red Star Roller will con-tinue to make a perfect contact. The Race and Roller will be smooth and even-without pits or bumps.



RED STAR Roller

Made of 100 point carbon tool steel, uniform through-out. Ground and polished to a mir-ror surface. Al-

Ordinary Roller
Surface hardened,
quickly wears uneven, gets bumpy
and pounds race.
Causing poor contact, loss of power and endless motor trouble.



HOROUGHLY tested and proved by years of hard wear, Red Star Timer is unquestionably made right. The greatest possible care is used in maintaining, thru accurate workmanship, the high standards of the Red Star Factory.

The highest grade materials are selected for each part. Lathe work, grinding and polishing are all done to the very limit of mechanical perfection.

Finest Material—Accurate Workmanship Rigid Inspection—Insure Red Star Quality

The 100 point carbon tool steel race at all times. Every Red Star roller is tempered just like a tool. It is ground concentric within one-thousandth of an inch and polished to a mirror like surface.

The race of "short-proof," bone-hard fibre and the butt-welded contact points are carefully lathe turned, ground and polished. Fibre and contact points have exactly the same resistance to wear-assuring a smooth, even undergoes nine tests and a final inspection. This vigilance is con-stantly maintained in order to assure every Red Star user a mechanically perfect Timer.

For years Ford owners all over the country have used and in-sisted on Red Star Timers because they stand up. Be sure you get a Red Star, the Red Star is on the box and stamped on the shell.

Our 1923 Catalog will be sent Free to any established dealer who writes us on his letterhead

Auto Components, Inc., Division of

Advance Automobile Accessories Corporation 21 Prairie Avenue Dept. 958 Chicago, Illino Chicago, Illinois 1721 Prairie Avenue

Advance Equipment is recognized from coast to coast as the finest made. When you buy an article of our manufacture for your automobile, you are sure that it is the best article for the purpose which money and manufacturing skill can produce.



ADVANCE ASBESTOS BRAKE LINING for LARGER CARS

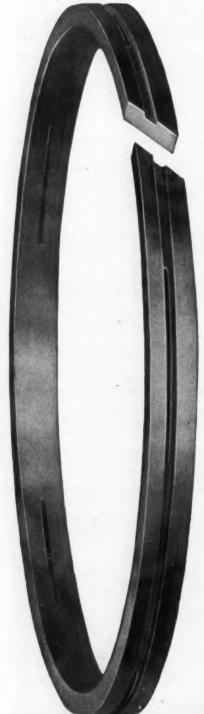






DVANCE EQUIPMEN "Every Product the Best of its Kind"

They Create Business For Garage Men and Jobbers!



Oil-Regulating Type

PRICE \$1.00 EACH

Piston Rings create piston ring business—for both garage men and jobbers. For example—

In the Middle West is a garage which a year ago started to feature these rings. It gained a reputation for knowing how to stop oil-pumping. And today, it has a long waiting list of motorists who want PERFECT CIRCLE Rings in their motors.

This experience is not unusual. And it is the result of many such experiences that caused one of the leading jobbers of Ohio to say:

"PERFECT CIRCLE Piston Rings have broughtmore new customers to our firm than any other line we ever handled".

PERFECT CIRCLE Oil-Regulating Rings stop oil-pumping—give an average oil-mileage of 1000 to 1500 miles to the gallon—and provide positive lubrication. Only one oil regulating ring is used to the piston.

Order a trial set of PERFECT CIRCLE Piston Rings. Install them. You'll know then why they build business for garage men—why they're the leading line with so many jobbers.

Perfect

PISTON RINGS

Marketed through recognized automotive jobbers, only.

PRICE 25c and up

Indiana Piston Ring Company

Hagerstown, Indiana

Harkrader & Harkrader: Western Sales Agents, 1603 S. Michigan Ave., Chicago

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Single Copies			cents

Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.



Never before has Goodrich tire quality registered such a sharp impression as it is doing this year.

"Buy GOODRICH" is the friendly suggestion passed daily by motorist to motorist.

"Sell GOODRICH" is the sensible advice given progressive, clear-thinking dealers.

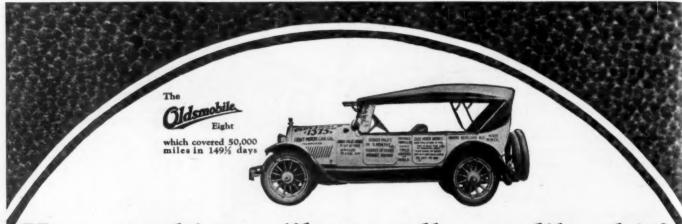
There is a reason for this universal preference for Goodrich.

The Goodrich tire, in cord or fabric, is the best tire value today, and is proving it in every climate and on every road throughout the nation.

B. F. GOODRICH RUBBER CO Akron, Ohio

Goodrich TIRES

"BEST IN THE LONG RUN"



How would you like to sell a car like this? 10 Years Mileage in 5 Months

The Frint Motor Car Company, Oldsmobile distributors at Milwaukee, ran a stock Oldsmobile Light Eight an average daily mileage of 334½ miles between May and December, 1922. That's 50,000 miles in 149½ days. In making this wonderful record the valves were ground only twice—after 20,000 miles and 33,000 miles respectively. Tire mileage averaged 17,000 miles per set; gas mileage averaged 15-1-10 miles per gallon—a remarkable record considering that the car traveled, rain or shine, every good and bad road in Wisconsin and

Northern Michigan. Engine oil was changed every 500 miles. Aside from minor adjustments, the only mishap was the breaking of two rivets in the spare tire carrier.

The 50,000 mile run of the Oldsmobile Light Eight is equivalent to 10 years of average driving—and the car is now on its second 50,000 miles and running as smoothly as ever.

How would you like to sell this kind of a car?

OLDSMOBILE

Oldsmobile, as a General Motors Product, enjoys the benefits of the findings of the greatest automobile laboratories in the world—the General Motors Research Laboratories, Dayton, Ohio, shown below. The Oldsmobile Light Eight Engine, after exhaustive tests at these laboratories, was declared the most powerful of all automobile engines of like piston displacement.

A PRODUCT OF GENERAL MOTORS



Human Interest in Your Business

If we can judge by the comments and response of the readers who write to us—and many of them do—two rather new features in MOTOR AGE are attracting much attention. These features were designed more for interest than importance. They are "23 Years Ago This Week in MOTOR AGE" and "Squeeks and Rattles."

These features were started in MOTOR AGE on the theory that even in a business paper there is an opportunity for something aside from routine and technicalities. Business men are human and they like to know things pertaining to their business that are just human in their interest. The readers of MOTOR AGE have, of course, their chief interest centered in the automotive business and the history and humor of this industry are worthy of consideration.

"23 Years Ago This Week in MOTOR AGE" is more than mere interest. At that period this industry was gathering strength and many experiences of those days have helped to build the fabric of the industry for today. Two weeks ago there was reprinted from MOTOR AGE of 23 years ago an item that told of the Wanamaker effort to sell automobiles in the great Philadelphia department store.

That experiment has been beneficial to the industry. These items are interesting to the old timers because of the personal association and they are important to the later recruits because they tell of the basis on which our present structure is built. In fact, this feature has proved of as great an interest as we expected it to, and it has proved of more importance.

"Squeeks and Rattles" needs no recommendation here. The readers have been quick to catch the spirit of this feature and many contributions are received for it. This page is well worth reading, for there is much more sense than humor in some of the quips gathered there—none will contend that they are not funny. This department has just been recognized by that great censor of humor "Topics of the Day" and one of the original jokes on this page is being flashed to the thousands who attend motion picture shows.



Nash Breaks a California Record

Next week newspapers all over the state of California will announce the arrival of the greatest single shipment of motor cars in the history of that commonwealth.

And they are Nash cars—the new model Fours and Sixes.

Two complete trains, one of 50 and the other of 60 fifty-foot cars were required to handle this immense order, valued at nearly three-quarters of a million dollars. They pulled out of Kenosha on the 28th of last month with a total of 515 Nash cars aboard.

Week by week the demand for the new Nash models not only in California but throughout the entire United States is growing tremendously in volume.

Automobile dealers who have been watching the rapid progress of the Nash Motors Company would do well to act *now* instead of waiting longer.

There are some good territories open where a real volume of profitable business awaits you if you have the Nash line. Write the Sales Department.

NASH

THE NASH MOTORS COMPANY

KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

(1332)

Selling Costs Reduced —Profits Increased—

One reason why dealers profit so highly from Marmon sales is because their selling costs are low.

For Marmon selling efforts are scientifically planned, and intelligently directed. Waste is eliminated. Marmon prospects are automatically



selected. Indiscriminate canvassing is avoided. All solicitation, by mail and in person, centers on men and women who are able to buy and can become interested in the Foremost Fine Car. (And the number of these is increasing daily.)

All this is part of Marmon's sales service to the dealer. His territory is carefully studied and its possibilities minutely explored by the Marmon Sales Extension Division. Then a complete campaign of selling is presented. This includes all the material for continuous circularizing—the most effective of its kind ever used by motor car dealers-and very thorough instruction for salesmen.

Do you have such advantages now? Are they coupled with a name that means so much to the motoring public as Marmon? If not, you are losing

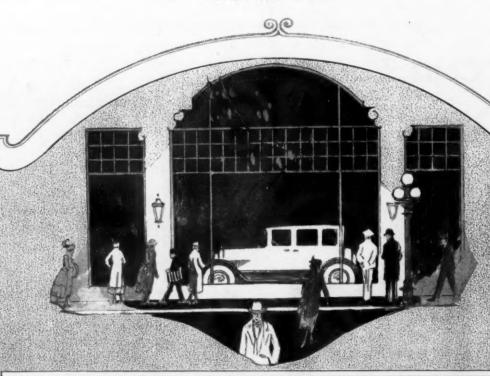
An opportunity awaits you. Write today for details concerning it.

NORDYKE & MARMON COMPANY

Established 1851 INDIANAPOLIS

Address Inquiries to Dept. A.

MARMON The Foremost Fine Car



A Dealer is Judged by the Line He Sells!

DUE to Reo's rigid standards, the holder of a Reo franchise is a man of unquestioned integrity and stability. The confidence of the buying public becomes his immediate asset.

And with the Reo line he can keep faith! Both to his public and himself.

For the Reo line comprises the 4-passenger Coupe, 5-passenger Sedan,

new 4-door Brougham, 7-passenger Touring Car and new Phaeton Reo, all on the famous Reo double-framed chassis, powered with the rugged 50 h. p. engine.

These, added to the Reo Taxicab, Speed Wagon (in 12 body styles), and a Passenger Bus chassis, truly represent a product for every sales season or occasion. And all are—

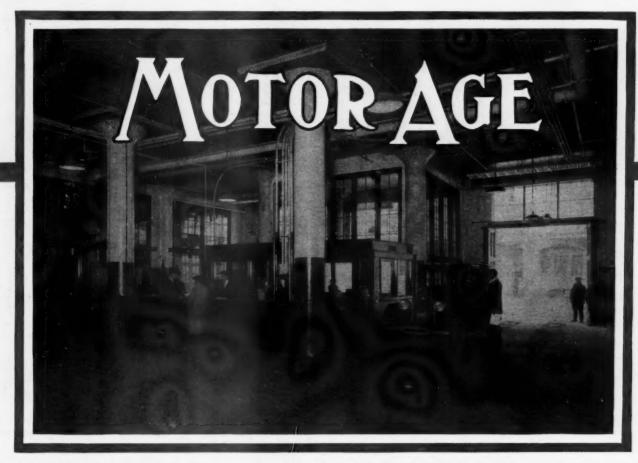
Manufactured in the Big Reo Shops-Not Assembled.

Territory is limited, but favorable applications will be considered.

Reo Motor Car Co., Lansing, Mich.

The Gold Standard of Values

900



In keeping with the modern version of selling maintenance, a customer entering the building of the Hudson Motor Car Co. of Illinois is met in the door by an inspector. Here is shown the inspector's desk and back of it the offices of the service department

Ninety Per Cent Service—Ten Per Cent Sales

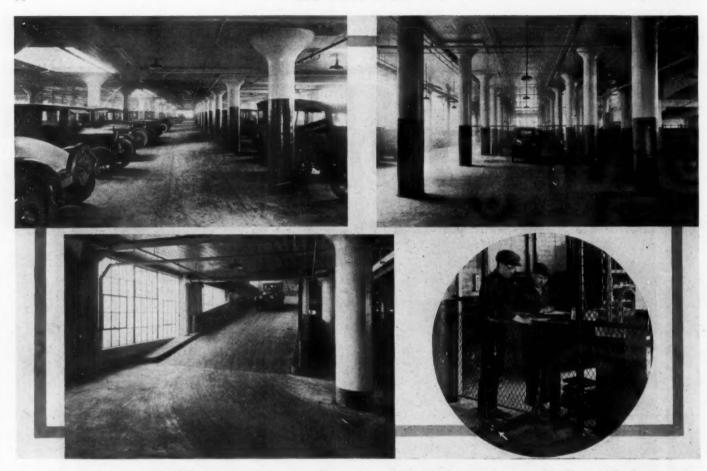
Importance of Adequate Maintenance Facilities Emphasized in New Structure of Hudson Motor Co. of Illinois. Work Handled on Production Basis. Ramp Construction and General Routing Plan Speed Up Operations. Good Shop Morale Created by Excellent Working Conditions.

By B. M. IKERT

HEN the Hudson Motor Car Co. of Illinois recently opened the doors of its new service and sales building at 2222 Michigan Avenue, Chicago, there was presented to the public what is probably as an efficiently planned and completely equipped an institution for handling in large volume the servicing and selling of automobiles as has ever been constructed.

We say servicing and selling, instead of selling and servicing because ninety per cent or more of the building is devoted to the servicing end of the business. The management feels that ninety per cent of the automobile business today is built on service. And with that in mind, it is but natural to find the new building of this company physically proportioned on approximately a ninety and ten basis.

The impression one gets in this institution, after having first become adjusted to the vastness of it, is that nothing has been left undone to smooth the path of the customer. Attention to detail is sometimes overlooked in large institutions, but here we find nothing has been overlooked to



These pictures give some idea of the vastness of the place. The main repair shop is shown at the upper left. Upper right, first floor view taken from rear of quick service department. Lower left, a car coming down the ramp from third floor. In circle, the boy on roller skates who takes tools and parts to and from mechanics in the shop

help every phase of the business. You cannot help putting the stamp of approval on every division of the business. The methods installed allow of the most approved way of selling service. And, it must be borne in mind that a large volume of business is done in this place and that, therefore, it is highly essential that the method of operating be such that nothing outside of a tornado or earthquake can hamper the steady flow and logical procedure of the work.

While the building is very large, 400 ft. long, 100 ft. wide and three stories high, those who planned it certainly did not work on the basis that as long as they had plenty of space it was all right to put this department here and that department there. Far from it. The layout of the various floors and departments is such that no false movements or wasted steps are possible. Everything was put down on paper and the plans drawn so the correct relation existed between the vari-



Much of the planning of the new building and its operating methods were evolved by Service Manager W. L. Silvis

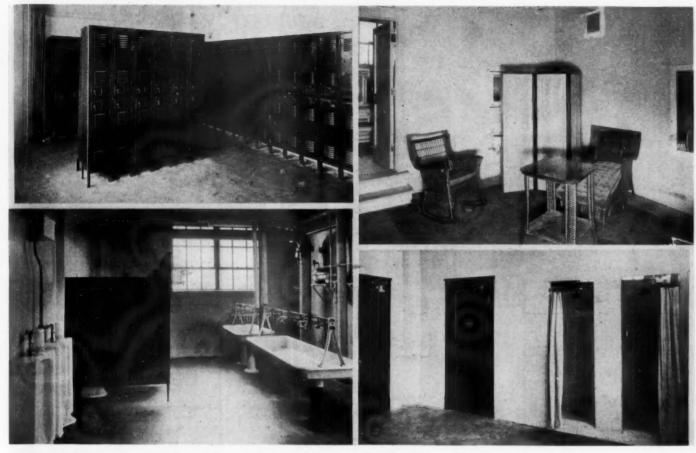
ous floors and departments. Congestion is impossible, that is under ordinary conditions. Unless every Hudson and Essex in Chicago is driven to the building at one time there is reason to believe the service station can adequately handle the work without crowding anybody.

The first floor of the service station, for example, which takes care of the quick service jobs, can easily accommodate 68 cars without crowding the aisles. The third floor on which is located the main repair shop, paint and trim shop, can house about 100 cars conveniently. Then there is the second floor which is given over to the conditioning of new cars and accommodates a large number of cars. The building layout is flexible and cars can be shunted to meet any emergency which may arise.

Before it is possible to render an account of the manner in which the work is handled in this building, it is essential that the reader know more about the physical characteristics of the building, the relation between the various departments and so on. We have already given the major dimensions of the structure and to these might be added the fact that the building extends for an entire block and is one of the largest, if, indeed, not the largest building devoted exclusively to service and sales in the country. Each floor contains practically an acre of floor space.

The salesroom and office entrance is on Michigan Avenue, and cars coming in for service use the Wabash Avenue entrance on the other end of the building. There are separate doors, one for entering and one for leaving the service department. The first floor houses the office of the service manager and service superintendent, testers, garage, quick service floor, used car salesroom, offices of sales executives and the general showroom. The second floor takes care of the new car department, parts department, reception rooms, geenral offices and executive offices. On the third floor is the general shop, machine shop, blacksmith shop, enameling ovens, paint shop and trim shop.

There are no elevators for moving cars. Instead, the building is provided with ramps, so laid out that cars can be run



Some of the conveniences for the employes. There are locker rooms for the men in the shop; shower baths and the fittings in the wash rooms are of the best quality. In the upper right view is shown the women's rest room

from the ground floor to the shop on the third floor in a few seconds. The entrance to the ramp on the first floor is to the left of the door through which cars enter the building and hugs the north wall of the building. On the second floor the path for cars is at right angles to the ramp and to the left.

The second ramp from the second floor to the third is on the south wall of the building. Inasmuch as there is no sharp curve to the ramp at the second floor, it is possible to drive cars up or down with safety and at comparatively high rates of speed. A mirror at the top of the first ramp shows at all times whether or not the second ramp is occupied by a car coming up or down. In the same way the mirror indicates to a driver on the second ramp the condition of the first. Both ramps are double, that is, cars going up or down can pass on them.

The boiler room located at the Wabash Avenue end of the building is an institution in itself. It is a small power house and would do justice to a small town. Besides housing two immense boilers, there are air compressors, pumps, machinery for operating the pneumatic tube system, hot water heaters and fire-fighting apparatus.

On the second floor, we find a section set aside for the air washing and heating system. All air used for ventilation is taken in from the outside, heated, washed and heated again to the proper temperature which can be regulated by hand or thermostats. A huge blower forces the air through conduits to all parts of the building. A separate heating system is used for the paint and varnish room, in which heat may be required at a time when it is not desired in the other parts of the building. Thus, it is not necessary to heat the salesroom or any other department, when heat is desired in the varnish drying room.

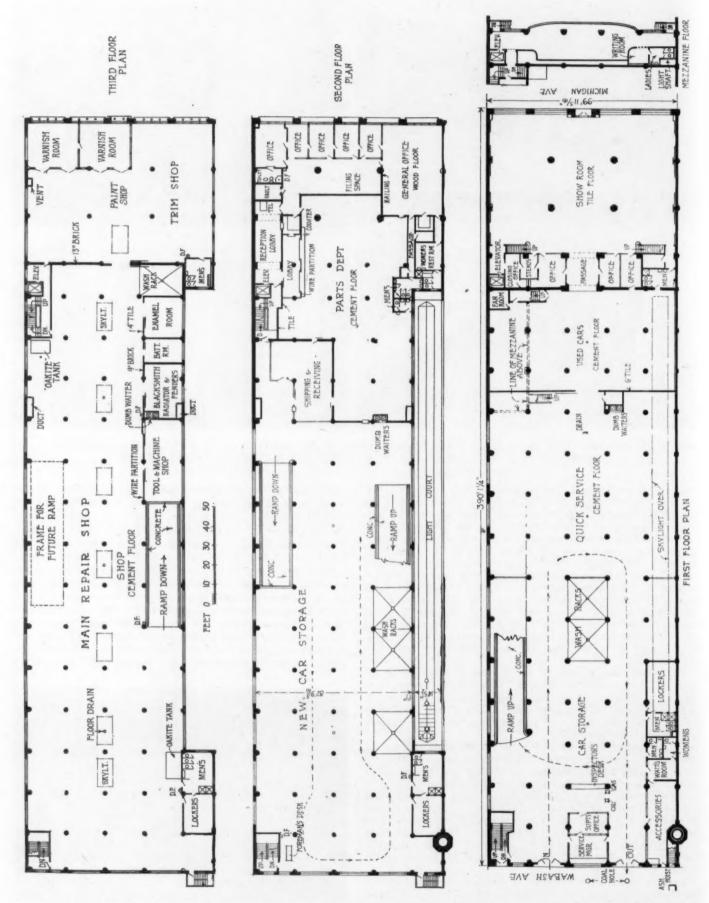
Another instance of economy is found in the arrangement for heating the water used throughout the building. Ordinarily the boilers take care of heating the water supply, but in addition there is a refuse burner in the boiler room which is arranged so the heat from it can be used to heat the water supply.

Illuminating gas, compressed air and electricity are carried to all parts of the shop for the use of the mechanics. An unusual amount of light enters the building and in addition the interior of the service station and shop is painted with "Barreled Sunlight." It would be difficult to find more ideal working conditions for the men in a place as large as this.

There are many time-saving utilities installed throughout the building. We already have mentioned the pneumatic tubes and in addition there are inter-department telephones for rapid communication between all members of the organization. An "Auto-call" system from the telephone switchboard makes it possible to locate any person almost instantly. There are electric dumb waiters to deliver parts to the shop and quick service floors in minimum time. Incidentally, these dumb



The machine shop, in which is performed such operations as cannot be performed by the mechanics. It is but one of the many departments located on the third floor



The floor plans of the new service and sales building of the Hudson Motor Car Co. of Illinois. The excellent relation of the various departments will be apparent from a study of these plans. The dotted line on the ground floor shows the routing of cars and that on the third floor the routing of a new car after purchase







At the left is shown one of the most important points in the building. It is the place where all costs are put on service customers' bills and the bills themselves made out. In the center is a typical tube station used by the mechanics in the shop in sending down there time cards. Right, tube station in the parts department

waiters are so constructed that the doors cannot be opened until the waiter is at rest at the point desired. This does away with all chances of accidents. An electric light is placed in the top of the waiter to illuminate the contents.

Being in business essentially to sell cars, the company has naturally devoted thought to making the showroom attractive. The sales department and offices occupy but a small portion of the building, but they have been arranged and finished very attractively. The lighting of the show room is particularly effective. This is so carried out that there are no shadows or reflections on the cars to create a wrong impression. Just back of the showroom is the used car salesroom and this in itself would do justice to many a dealer's new car showroom. It is attractively finished and the atmosphere conveys an impression of new cars rather than used. Incidentally, all the cars here have been reconditioned and they are on display, not crowded into a back room. Cars which cannot be put into reliable condition by the company are disposed of outside.

The company states that heretofore the used cars were handled on the outside in separate quarters but did not sell as readily as they now do. The atmosphere of the former surroundings did not encourage it. A detail which has proved very effective thus far is the placing of a neat showcase just at the entrance of the used car showroom. A person entering the department must pass to the right or left of this showcase and invariably looks at the contents. Many a sale of accessories is attributed to this.

Getting in touch with the customer the moment he comes in, moving the cars to the shop or quick service department with dispatch, getting the car owner's signature on the work order and letting him know just what the cost will be, and many

similar things which put maintenance on a paying basis seem to have been the factors which governed the laying out of the work in the service station of the Hudson Motor Car Co. of Illinois. There is always a good reason for doing things as they are done in this service station, nothing has been guessed at. The company's former experience has been used to advantage in the new building.

The flat rate system which was used in the old building is used to far better advantage here. The time element and flat rate are more or less inseparable and in the new Hudson-Essex service station the time element for handling the work from the time the customer drives in until he drives out has been reduced to the minimum with the excellent facilities and system used and devised largely under the direction of Service Manager L. W. Silvis.

To begin with, there is no necessity for a customer to toot his horn and wait for someone to open the door. A man is on constant duty watching the approach and as soon as a customer drives up, this man presses a button which electrically opens the door. The customer once inside the place, usually stops within a short distance of the door, where he is instructed to drive on and around to the right and back toward the rear of the building again, but on the other side. A service salesman or inspector, who has observed his coming into the building, ascertains his wishes after the car is brought to a halt and if the job is one of quick service it is parked either in the garage section or the quick service section.

If the job is one which requires leaving the car for some time, the order is made out, signed by the customer, who at the time is informed of the cost of the work, and the car is driven to the left past the counter just back of the service





At the left is shown a new car taken from storage which is being prepared by the new car department. The other view shows two mechanics putting the finishing touches on a car before it is cleaned and polished for delivery





It is not necessary for service inspectors or others to ask the car owner about his car. The card to which the inspector is referring here gives all necessary information. Quick service is rendered while a customer waits for the car. Part of the first floor is given over to this. Note the abundance of light, which, by the way, is found throughout the establishment

manager's office and up the ramp to the third floor. Meanwhile, the order sheet, made out in the presence of the customer, is sent by way of the pneumatic tube to the shop foreman. Consequently, by the time car gets there the repair order also has arrived and the work can be started immediately.

A word here about the handling of parts in the quick service department. A waiting customer gets first choice, always. Thus we find the requisitions for parts made out in the quick service department placed in tubes painted red and when these reach the parts department upstairs via the pneumatic tube, the attendant immediately fills the requisition and sends the parts down in the dumb-waiter. The latter is placed very close to the quick service department, as will be noted from the ground plan of the first floor. All requisitions for parts from other departments are sent in plain tubes.

At this point it may be well to note how record is kept of the parts used on any particular job. When the foreman in the quick service department makes out a requisition for a part, the stockroom man makes out in triplicate a form, one copy of which goes to the service department office, another to the general office and the third he keeps for his own records.

As soon as the service office copy arrives, the name of the part and price is placed on the back of the repair order form. Should another part be needed for the same job a similar procedure is gone through. Even if a purchase is made outside the service station, such as a certain type of spotlight or something similar the customer may want, a copy of the requisition and price of the part comes to the service office for posting on the back of the repair bill.

In order that the clerks in the service office may know when a car in the shop has been supplied with the last part required, the copy of the requisition sent to the service office is stamped with a suitable stamp. They know then that no more parts have to be added to the repair order and the total of the bill can then be made out.

Just outside the service office is a rack containing cards on which are listed the names of all Hudson and Essex owners who have been sold cars by the company. This card is a great help to the service salesmen and inspectors because they can get all necessary information about the car without asking the owner. In addition to the customer's name, the card indicates his address, kind of car, when purchased and the name of the salesman who sold the car. Also, whenever a job is performed on a car the date the car was in the shop and the repair order number is placed on another card which is filed in the service office. This gives at all times a history of the car and by referring back to the original repair order form the company can tell exactly what was done to the car and the price of the job.

One of the features in connecting with the sale of a new car is the rapid manner in which it is prepared or conditioned by the new car department. Immediately after the purchase of a car a notice goes out from the office of the sales manager's secretary to the foreman of the new car department that Mr. Jones or Smith has bought a Hudson coach, let us say. A Hudson coach is then brought forth from the new car stock and placed to the left of the foreman's desk. Then it is conditioned progressively, finishing with a polish at a point near the top of the ramp. The car can then be driven by the customer down the ramp and out of the building through the exit from the service department.

The wash rack for cleaning and polishing customers' cars is located on the main floor of the service station and at a point where it least interferes with other work. The work is handled progressively; that is, the cars are first washed at one point and then moved a few feet to another spot where they are wiped dry and polished. The cars, after polishing, are headed in a direction which enables them to be directly driven out of the building. This is in keeping with the regular routing order of the cars on the first floor, and will be readily understood by reference to the floor plan.

In the main repair shop the company is prepared to handle practically every class of work. The blacksmith shop takes care of all such work as straightening bent axles and welding. Then there is the machine shop, which is fitted with equipment such as lathes and drill presses, to handle all work required of such a shop. The shop is in charge of a competent machinist and it is not necessary for any mechanic to undertake a job which may require lathe work or other special work with which he is not very familiar.

A rather novel feature of the main repair shop is the boy on roller skates who literally does all the walking for the mechanics. In a shop as vast as this one, much valuable time could be wasted by the mechanics in going back and forth from their benches or cars to the parts department or tool room. Consequently, when a mechanic needs a part he informs the foreman and the boy on roller skates does the rest.

Leaks in the tool room or parts department have been prevented by the fact that the mechanics must present a check for anything taken away.

So completely equipped is the shop, that the company is practically independent of outside help. With the exception of cylinder regrinding work, everything can be done in the company's building. There is the enameling room, for instance, which can take care of all such jobs as baking the finish on fenders, radiator shells and lamps. In the same room is apparatus for repairing radiator shells, and while there is little call for this class of work, the company states that it has done its part in tooling up for any possible job

that might come along and the performance of which will help to render better service to customers.

In the trim shop, seat covers, tire covers, tops, curtains and other work of this class is taken care of, and here again we find the most up-to-date equipment for carrying on the work. There is one machine, for instance, used for cutting material which cost in the neighborhood of \$350. It is electrically driven and will cut, even in intricate patterns, a pile of stock some two in. or so thick. The furniture in the rest rooms, by the way, was upholstered in the company's trim shop and various other fitments in the salesroom, and offices were prepared in this department.

The paint shop is well lighted and fitted with rust-proof drying rooms, which can be set to any temperature by a thermostat. It will be noted from the plans that the paint shop is located quite close to the blacksmith shop, where such parts as fenders can first be straightened before refinishing. There is also a wash rack close by for cleaning cars before refinishing. Cleanliness, in fact, plays an important part throughout the establishment. There are several Oakite tanks for cleaning parts before they are worked on by the mechanics.

One of the things which impresses the visitor is the excellent manner in which the company has looked after the men in the way of establishing locker rooms and washrooms. Every department has its own washroom facilities and the fittings in these are of the best quality. These rooms are large, well lighted and ventilated, and certainly help to create a good shop morale.

On the ground floor, rest rooms have been provided for the customers who wait for their cars. Besides, there has been set aside a space for the display and selling of accessories. This room is made with glass partitions and the thought is that as a customer waits for his car he naturally looks about the place and is quite likely to be attracted by a well displayed line of accessories.

Probably one reason why the building and its fittings, together with the operating methods, have worked out so successfully is because General Manager J. R. Histed and his associates traveled many hundreds of miles and made a careful survey of some of the country's modern service and sales buildings before the plans were drawn. It is felt, therefore, that the new building of the Hudson Motor Car Co. of Illinois represents all that is best in the modern version of selling and servicing automobiles. The building is a tribute to the industry and those connected with the organization have a right to feel proud of being able to contribute their share toward making the people who have bought cars from this establishment pleased with their product.

23 Years Ago This Week In MOTOR AGE

(From Motor Age of March 8, 1900)
Automobiles Increasing—in 1900

Everywhere in the strees one sees evidence of the constant increase in the number of automobiles-they are doubling, quadrupling, becoming the fad and rage of the hour, says the New York Herald. They have come to stay, too, and if anyone were to ask for evidence of the great popular growth of the horseless carriage it is to be found easily. Not only is ocular demonstration at hand, but the great factories of the country are being piled with orders that cannot be filled readily, owing to contracts al-A dispatch from Amesready placed. bury, Mass., says that a representative of one company in New York alone has placed there orders for from twenty to thirty automobiles a day for the coming six months.

Preparing for a New York Show NEW YORK, March 2 (1900)—Albert Bostwick, the chairman of the committee in charge of the proposed motor vehicle exhibition next autumn, to be promoted by the Automobile Club of America at Madison Square Garden, was seen today by a Motor Age man and gave further and more definite particulars of the plans that were contained in the first announcement in these columns. Not content with his promotion of the American challenge for the Bennett International cup, this hustling young enthusiast has made time to outline plans for the proposed show, which he will put into final execution on his return from his trip abroad to represent the club at the race on June 14.

(Further details were that there was to be a center space circled by a track upon races and contests were to staged.)

More than a column was given to a description of an "auto-sled" which was

designed for use in hauling timber in Minnesota. This auto-sled was said to be capable of pulling 15 sleds loaded with logs.

"Absurd Claims," This Was Headed

The following statement, alleged to have been circulated by a member of the enor-mously-capitalized Anglo-American Vehicle Co., is going the rounds of the press: expect to see the day when men of Phila-delphia who do business in New York will ride over in the morning in their private carriage and will return in the afternoon. They will make the trip in an hour. Their automobiles will have flanged rubber wheels and will travel on the tracks of the Pennsylvania railroad. Ninety miles an hour will be no speed at all for our new models. They can make that on a dirt

road. On steel rails they ought to go much faster."

Notes of Interest

The Prince of Wales has placed an order for an automobile, a fact which gives great satisfaction to the manufacturers in Great Britain and one which they hope will give a fillip to the trade in that country, which, strangely, is none too good.

San Francisco falls into line with an arrest of an automobile driver for invading the sacred precincts of the Golden

Ten thousand cabmen of Naples have gone on a strike to prevent the introduction of auto-cabs in that city.

13 Dealer Points

B. BARTHOLOMEW is head of the · Avery Co., manufacturers of farm implements and tractors. Recently "J. B." drafted a good farm implement dealer platform of 13 points, which platform has suggestions that other than the sort of dealers at whom this was aimed may well consider. So what follows is a manufacturer's idea of a good dealer:

(1)-A Real Dealer sells a line because it is "just as good if not better" and is complete.

(2)—A Real Dealer is loyal because he believes in his goods and the people that make it and likes to co-operate with

(3)-A Real Dealer advertises locally and backs up the national advertising.

(4)-A Real Dealer keeps a card index of prospects.

(5)-A Real Dealer keeps after his prospects, sending them letters, circulars and other printed matter.

(6)-A Real Dealer has confidence in his goods and knows what they will do in the field.

(7)—A Real Dealer is always ready to show his goods and glad to make demonstrations.

(8)—A Real Dealer keeps a reasonable stock of repairs.

(9)-A Real Dealer is never afraid to stock machinery.

(10)-A Real Dealer gives three kinds of service: (a) Acts as farm equipment purchasing agent for his community and carries an adequate stock. (b) Is prepared to teach buyers and users how to operate, repair and keep the equipment they buy in order. (c) Is prepared to give freely the free service that his good judgment dictates should be free and charge only a fair price for that for which the customer should pay.

(11)-A Real Dealer is able to judge credits and make sales and settlements in strict accordance with this ability.

(12)-A Real Dealer has proper financial arrangements with the banks, or others, whereby he can negotiate the paper he takes, pay cash for his goods and reap the advantage of every discount available.

(13)—A Real Dealer keeps accurate record on the due dates of all his paper and, if he discounts, he sees to it that the collection is looked after in a reasonable way from his point of view.

Bill Fixit's Return

Bill Gives a Lesson on Batteries as the First Step in Selling the Cars Already Sold

By A. H. PACKER

"S TEP on de button, she'll shooly go.
It's de juice dat makes de motor mow.

Unless by chance yer may have foun' Dey's russ and dirt on de battry groun'."

O sang the porter at his work, for he picked up here and there the jingles Bill had used to teach his men some of the live points on trouble shooting. And R. R. J. B. was surely working this fine morning, for colored boys that knew Bill also knew that results and nothing else but made a hit with the boss.

A touch of spring was in the air, but here and there the water from the front windows froze as the porter's persuasive motions shot it from the glass to the sidewalk, and to himself he crooned another song, with words Bill had coined on a certain occasion when a careless shop man using only a pint of alcohol had been the cause of a radiator bursting:

"Rufus Rastus Johnson Brown
Says it's cold in this-shere town.
Haf per cent alcohol ain't so nifty;
To save the radiator 't should be fifty."

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 T^{HE} first conference between Bill and the Red Head was brief but snappy. Bill started it.

"For one month we are not going to push the sale of Runwell cars, we may wait longer. Our first job is to get salesmen."

"But," said the Red Head. He got no further.

"But me no buts," said Bill. "We will need salesmen to sell the business, not the cars, for if Smithers with his oily ways could not sell cars, there is no use of our trying, that is for awhile. Then I am going to get another first aid to a drooping business, a sort of surprise for you." Bill's eye twinkled. "You remember the best car in the show, and what made you think it the best?"

"G'wan," said Red. "It was a good car, even without the girl in it."

"Yes," said Bill, "but selling is a job where you have to have good stuff but you also have to make people take a look before you have much of a chance. That's where the girl comes in."

"You remember that little black-haired mischief that used to pedal milk around here some years ago. Well, she considers herself a young lady now, is through high school, has had some sort of busi-



"Rufus Rastus Johnsson Brown Says its cold in this-shere town."

ness training there, and what's best of all, she knows all the girls in town and takes in every dance that's pulled off."

"Too deep for me," said the Red Head, "unless perhaps you are going to run a dancing school, but I guess I can wait and see what's up your sleeve."

"All right," said Bill. "If I have your approval on that little point, we will proceed with the grosser details of our attack on this defenseless community. If there are four hundred and sixty-seven owners of Runwell cars in this neck of the woods, then there are that many knockers, multiplied by the number of members in their families, added to which you can put all their friends and relations, and all due to Smithers

and his poor shop facilities. That's a hard situation to buck up against, so we won't do it. It's too hard a proposition to break so it must be dissolved. That's the next job you and I have on our hands."

"All right," said the Red Head, "and what's my part of the job?"

"The shop end's yours. The first thing you do is to go through our parts stock and see what we need. Your next job is to see that we get it if you have to use telegrams, telephone, radio or get it yourself.

"We are going to sell Runwell cars by first showing the present owners that they have a real bus, or, if not, that we can make it a real car and we are going to show them that we can do the job without taking all summer or a mortgage on their farm. After that little detail has been taken caré of, we won't need to sell cars, we will just hire an order clerk, tell the folks to stand in line and not push."

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B ILL helped himself to a cracker from the open barrel and waited to talk to the grocery clerk. Aunt Jessica, having dispensed her stock of news items to the helpless clerk, gathered her packages together, nodded as she passed Bill, and faded out through the doorway.

Charlemagne Hutchinson, thus afflicted to please a French aunt, supposedly rich, turned to wait on Bill.

"Didn't come to buy anything, Chuck," volunteered Bill, "Jes wanted to see if you're keepin' your crackers fresh as usual." Chuck's genial smile was unruffled and Bill continued: "Fact is I want you to come over to the new place and work for me selling cars. You can beat the \$12 a week you're making here by a whole lot. It all depends on you."

Chuck turned a little pale as though he had received a commission to teach table manners to an African tiger.

"I d-d-d-no how t-t-to sell cars," he faultered. Bill laughed. It was what he expected, and he was not disturbed.

"Do you know anything about the groceries you sell?" asked Bill. The color started into Chuck's face as he came back to a familiar subject.

"Guess I do." Chuck almost smiled. "Been to a bread factory and a cannery.

"Know the difference between sifted peas and the kind that's nearly as big as cherries. Helps quite a bit, too, to know what cans you've got and what's in 'em when folks don't quite know what they want for supper."

"Never have trouble with folks getting sore, do you? Always fix 'em up, kid 'em a bit and send 'em away happy." Bill answered the question himself and asked another. "How about that grocery truck you drive around. Who keeps that goin'?"

"Oh," said Chuck, beginning to see daylight. "You mean that because I fix up the old truck and sell stuff and keep folks happy that I might sell cars."

"That's the plot exactly," said Bill.
"I'll see you tomorrow. Don't show upearly, eight 'll be time enough."



T was a queer conference that gathered the morning following the selection of the sales force. The shop gang was there and a casual observer would have had a hard time telling just who was supposed to be the manager of the business. Bill had discarded his collar for the occasion, and had rolled up his sleeves. He knew the effect of appearance, but also the vital necessity of being one of the men.

Bill outlined the plan of attack. Red's job of bringing the stock up to date was again mentioned, and the idea of selling the value of Runwell cars to the present owners was gone into. The shock troops for this attack were the men in the shop. for mainly on them was the burden of getting each job absolutely right, or the whole plan would fall flat. Bill would start the outside work by calling on the Runwell users, for the purpose of showing them that there was no better car, when backed up by proper maintenance facilities. Chuck Hutchinson would go into the shop for four or five days or perhaps a week and would then join Bill in his outside activities.

For the time being they would forget there were new cars on the show room floor and more coming from the factory until the big job of selling the present owners had been completed. Then the time would be ripe to go after the prospects uncovered on the earlier trips.



"Aunt Jessica nodded as she passed Bill, and faded out through the doorway"

"Of all the grief the present owners are having," said Bill, "the greatest is doubtless due to the electrical equipment, not because it is at fault especially, but because of the owner's ignorance of that part of the car, and the battery probably comes in for more abuse than any other part of the electrical system. For that reason we will first make sure that we in our little business family know all we need to about batteries, and that we then use this knowledge, and convey as much of it as seems necessary to the car users.

"Battery plates half out of acid are nearly as hard up as a fish would be half out of water and the life of one under such circumstances is about the same as the life of the other. Hutch, you make a note of that, and perhaps you can show some of the Runwell users that when the starter does not work that it may be the fault of the battery,

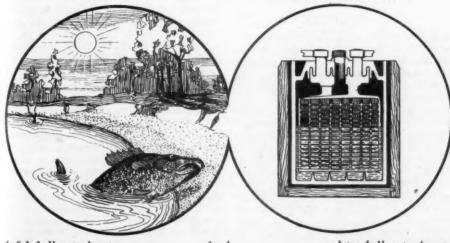
which in turn may be due to neglect rather than anything else.

"Another thing that the salesman and the service man can impress on the car user, is the value of having a hydrometer. Folks around here can't get into our place as often as they might in a big city, so the next best thing is to check the battery occasionally themselves. Putting in water frequently, and be sure you tell them distilled water, not well water, combined with an occasional test with the hydrometer will be about all they need to do to the battery.

"Then if you find a customer who is a little more industrious than the run of them you can tell him that it is a good idea to clean up the battery terminals occasionally with a teaspoonful of baking soda dissolved in a cup of water. This will wash off the acid and corrosion and make the terminals last longer. Then if a bit of vaseline is smeared over the terminals that also helps to cut down the corrosive effect of the acid that works up out of the cells in a sort of film which spreads over everything.

"Another thing you can tell our folks, and that is never to put any fancy dope into the battery. It already has all the acid it needs and when the water evaporates, the thing it needs is water, not dope. The only way to get current out of the battery is to run current in. Some of the concoctions being sold do seem to give extra life, but they do it by using strong acid which eats up the plates, and then, good-night, it means a new battery. We do not mind selling a new battery when the time comes, but we want our customers to get what they are paying for.

"Inside the battery we have two groups of plates, each plate being made up of a sort of lattice work, into the spaces of which a softer material is pasted. When



A fish half out of water is usually a dead one

A-n-d

plates half out of water indicate a battery that soon will be a dead one

a battery is finished and fully charged, this soft material is spongy lead in the negative plates and lead oxide in the positive plates. The two volt reading that we get at each cell by using a meter is due to the nature of the metals and does not depend on the size of the plates, but the amount of current that we can take from a cell or battery does depend on the plate surface available. For this reason a large battery will give out more current than a small one, but the voltage will be the same for the same number of cells.

"When current is taken from a charged battery, the acid in the cell combines with the material of the plates changing both to lead sulphate, which is in a finely divided state. Current forced into the battery can now change this sulphate back into lead oxide and spongy lead, so that we get the negative and positive plates back into their original condition. For this reason there isn't any such thing as a battery that does not sulphate as it is the natural action in a sulphuric acid lead plate battery when it discharges.

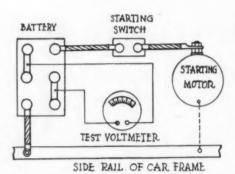
A Hydrometer in Time Saves Nine [hours of charging a sulphated battery]

"The sulphate that does the harm, however, is a crystaline form into which the finely divided sulphate changes and it is very difficult for the charging current to change this sulphate back into the original material of which the plates are composed. That's one good reason why we should sell hydrometers and teach our customers to use them, so they will not ruin their batteries by letting them stand discharged. In winter there is another reason, for a badly discharged battery freezes if the temperature drops below zero.

"When you boys come to testing batteries, you will find there are a number of tests you can easily make, right on the car. The first one is more of an inspection, to see if there is water in the cells or whether the user has allowed the battery to get dry. Then you can also check the gravity, assuming there is enough of the liquid above the plates to fill the hydrometer.

"The battery is sometimes said to be dead by those who do not know any better when the trouble is really in the cable terminal connections. I have made up a sketch showing a typical starting circuit, and in this sketch I have also shown a test voltmeter being used. The way it is shown though is not right for our first test. This test is so easy it is a shame to take the money, for to locate poor connections in the starter circuit, all you have to do is to turn on the lights and step on the starter button.

"If the lights go out, it shows a poor connection exists. Then just hold the starter button down a few seconds, perhaps thirty, and then feel of the ground connection and the connections on the battery posts. The one that is hot is the one that needs cleaning. Dirt and corrosion produce a high resistance and current flowing through such a resis-



A voltmeter locates shorted or open cells and poor connections

tance produces heat. That's one way of finding this kind of trouble.

"Another way is to use the voltmeter but connect it to the frame of the car and to the ground terminal that is bolted to the frame. If the connection is quite good there will be but little resistance at this point and with starter current flowing there will be but a barely perceptible movement of the needle. On the other hand, if the connection is poor there will be a considerable voltmeter reading, perhaps a volt or two when the starter button is operated.

"When you come to hunt for shorted cells in the battery you can also do the job either on the bench or on the car. Our voltmeter connection in the sketch is now exactly right for checking the center cell, and we will assume that the meter shows 2.2 volts when no current is flowing from the battery. When the starter button is operated, this voltage of the cell will drop to perhaps 2.0 or 1.9 volts if the battery is well charged and may drop lower if the battery is more or less discharged.

"Best results in this test are obtained by comparing readings on the different cells, and if at any one cell the reading drops down abnormally when current flows it shows the cell to be shorted. In other words, it needs new separators.

"In a shorted cell you will often get a condition that makes the voltmeter read backward from the way it would if the cell were in good condition. This may seem strange but is easily explained. When a cell is in good condition it is pushing the electricity along the circuit, but when it is shorted it loses its ability to help the other cells, and is a drag or load on them so that it retards rather than helps the flow of electricity. This shows up on the voltmeter reading, making the needle go in the opposite direction.

When the Battery Burns Up the Generator

"Now," said Bill, "there's just one more little kink I want to tell you this morning about batteries, and the strange part of it is that it shows up as a burnt out generator. Doesn't often happen, but when it does it certainly puzzles the average fellow.

"So when you get a generator where the armature has been cooked and the fields look the same and the machine is a wreck generally, do not make the mistake of repairing it and putting the machine back on without checking the battery before the customer gets away. The same connections will do for the test voltmeter, but this time we test with the engine running and the generator charging the battery.

"A battery that is in good condition with the gravity pretty well up toward 1280 may show most any voltage on open circuit, but when you start to charge it the voltage comes up to about 2.5 per cell. If the battery is not well charged, the voltage will rise but not so much, coming up possibly from 2.0 to 2.1 volts. Suppose, however, that the test meter should show a cell voltage of 10 with the generator charging, it would certainly show an abnormal condition. The answer in this case is that one of the battery posts is broken loose from the plate assembly, down inside the battery somewhere, and the current has a hard time getting through this poor connection, so that it backs up like water at a dam and shows the high pressure or voltage."

Talk Their Own Language

M OTOR CAR EXCHANGE, distributor of Winton and Lexington cars in Buffalo, finds it pays to "work" the Polish section of Buffalo through salesmen who live in that section and who speak the language of its people.

Buffalo with its population of 530,000 has 180,000 residents of Polish birth or descent. In other words about one-third of the entire population is Polish. This percentage has prevailed for many years, during which thousands of the Poles have created businesses for themselves or have filled prominent niches in the professions. These conditions continue.

The Polish citizens of Buffalo are thrifty and many of them are prosperous. They have pretty well developed understanding of the utilitarian and pleasurable possibilities of the automobile, as is attested by the fact that thousands of the cars on record in the state tax bureau in Buffalo are listed as belonging to owners with Polish names. Trucks are largely used by Polish business men, many of whom are whole-salers.

"We employ Polish salesmen," said A. Bingeman of Motor Car Exchange, "men who were born and reared in the Polish section, who have wide acquaintances there and who know where to and how to dig up prospects and how to make sales, and they make a good many sales."

While Bingeman was saying this a Polish business man accompanied by one of the company's Polish salesmen, entered the salesroom. The salesman immediately began explaining in the Polish language the advantages of a Lexington sedan in which he had interested the prospect.

Is the Car Owner Unreasonable in Service Demands?

Here Is His View, as Relayed by the Editor of a Leading Motor Car Owner Paper

By ALEXANDER JOHNSON

Editor of Motor

This view of service is the major part of an address by Mr. Johnson before the recent National Automobile Chamber of Commerce Factory Service Manager's convention in Chicago.

I is a great pleasure to address you on the subject of service as the individual American car owner sees it and would like to have it. Mingled with the pleasure is a considerable element of embarrassment, when I remember that I, who know service only casually and indirectly, am talking to the foremost experts in the business of supplying automotive service.

And yet it sometimes happens that the outsider, bringing a fresh point of view to bear on problems that have grown stale to the experts, may suggest something helpful from his very ignorance of the finer details. Furthermore, perhaps, I have had opportunities of gaining a point of view that is not entirely familiar to you gentlemen. The magazine, of which I have the honor to be editor, takes as its object the serving of the interests of these individual car owners, who make life a series of surprises for you service managers. We have a number of thousands of readers every month and never a month passes that each of these does not take his pen in hand and inform us of some grievance that has been thrust upon him by the service department of the car he happens to own. Invariably these letters hold me personally responsible for any dereliction of duty on the part of the service branch of the industry.

Service Problems Begin in Factory

Let us examine briefly the attitude of the average motor car owner toward service. It is not an exaggeration, I think, to say that the average owner would answer the question, "What kind of service do you get?" by the single inelegant word "Rotten." It isn't true. Service today is vastly improved over what it was a few years ago and I believe that you gentlemen are going to make it so good that not even the captious owner can fail to recognize its goodness. Human nature is so constituted that it invariably remembers ills long after it has forgotten pleasant happenings. The car owner forgets the dozen times his job came out of the shop on time with a reasonable charge attached in favor of remembering the once that he had to wait an extra week for it and pay a thumping bill to have a major operation performed, the necessity for which was probably caused by his own carelessness.

It must be remembered that the present generation of motor car owners is very largely ignorant of the mechanical principles and units that go to make up the vehicle it drives. The average owner can perhaps diagnose vaguely the troubles that afflict his car. He can guess that "something is wrong with a bearing" or that "the ignition system isn't ignishing," but he cannot diagnose exactly. This leaves him pretty nearly at the mercy of the dishonest repairman. When anything happens, there is nothing for the car owner to do but hand the vehicle over to the repairman and take his word for what needs to be done, and later, with the bill, for what has been Dishonest repairmen take advantage of his condition. We all know that.

Education of Owners Needed

I believe that the first step toward placing service on a better basis is the education of the owner. It is impossible to put all our middle-aged owners through a course in automobile mechanics and teach them to diagnose troubles and be able to direct repair operations. But suppose that every car owner were supplied with a cost sheet giving him the cost of each repair operation on his car, as the factory has worked it out, and as it will be carried out by his local service station. Wouldn't this not only take away from the bill for repairs much of its present mysterious aspect of all multiplication and no subtraction and would it not also do a great deal toward persuading owners to bring their cars to a local service station of their particular makes?

And that latter point is important because the car owner does not distinguish between the service station operated by the dealer handling his make of car and the repair shop operated by the reincarnation of Jesse James. It is all service to the owner. If he gets poor service and a whacking bill from the "gyp" repairman, he cusses the service branch of the industry without distinction.

Give your owners something to dissipate a little of the mystery that for them has always hung over a repair bill. Let them have a chance to estimate costs for themselves. Remove the grievance that has always existed because of owner ignorance and the feeling that it breeds that behind the curtain lurks sharp practice.

I firmly believe the company which

gives its owners a cost sheet, showing them what the various repair and replacement operations will be carried out for in their own service stations, will rapidly ween its owners away from the casual repair shop and the perpetual grouch against the service department.

Another tremendous benefit that would come to the car owner through possession of a detailed cost sheet covering his car, would be upon the occasions when he has to employ the services of an outside repair shop, as, for instance, when he is on tour and has to have work done in a place where his make of car has no service station. With a cost sheet in hand, he could estimate just what he ought to be charged by the outside repairman and decide whether he will pay the charge actually made. Armed with the cost sheet, he can shop along repair row, until he finds a man substantially in accord with what he knows to be the correct price of the operation involved.

Show the Owner Replaced Parts

And here is another frequently encountered cause of owner dissatisfaction: When a bill is rendered for replacement of parts, never is there a glimpse of these parts. Why not make it a practice to have all replaced parts handed back to the owner with his bill? Let him junk them, but give him a chance to see the worn out or damaged parts for which he is paying a replacement bill. Then there would be no more grumbling: "They say they put in such and such a bearing or such another part, I've paid for it, but how do I know they really did anything of the sort?" believe me, in the "gyp" repair shops they very seldom do. If the official servicing branch of the industry set this example of making a practice of showing owners replaced parts, it would be another strong inducement to bring these owners into their official service sta-

What Service Can Be Given

There is today, perhaps there always will be, considerable divergance between what the car owner thinks he ought to get in the way of service and what he actually can be given. The motor car manufacturer ought not to be compelled to lose money in servicing his vehicles. He ought to be allowed to make a reasonable profit on the operation. On the other hand, in transforming motor vehicles into transportation, the service di-

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vision ought to be sure that it is performing its task at a cost to the car owner low enough to make the transportation worth buying. If it costs as much to service a vehicle in the second year of its life as it did to buy it in the first place, obviously that is very expensive transportation. This is an exaggeration, of course, but it makes the point clear, I think. The prime desire of the automobile industry is satisfied owners. The only way they can be obtained is by the service division furnishing them with satisfactory transportation at cost that makes it worth while.

These suggestions are merely a recapitulation of complaints that I have heard from thousands and thousands of times by car owners, of complaints which constitute a goodly proportion of my morning's mail every day of the year. They are not entirely justified, but there is an element of truth in them. I have faith in the service branch of the industry and I believe it will find the needed remedies for present conditions. This convention is proof positive that the service division is awake and moving in the right direction. Only by experience can we learn, and the value of such an association as this, where experts from every section of the country meet and exchange experiences, offer suggestions and discuss means of making the transportation which we are giving America. even more satisfactory than it is.

Book Review

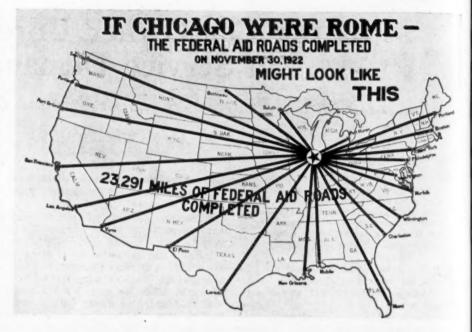
Elliott—Automobile Power Plants. Published February, 1923.

By Ben G. Elliott, Professor of Mechanical Engineering, University of Wisconsin. 323 pages, 5½x8, 291 illustrations. \$3.00.

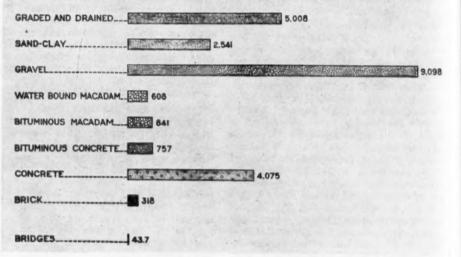
A test and reference book on the modern gasoline automobile engine. The book presents fundamental principles and practice employed in the construction operation and care of the internal combustion engine as used in modern automobiles. The principles are illustrated by many examples from practice. Much material on specific engines and parts is included.

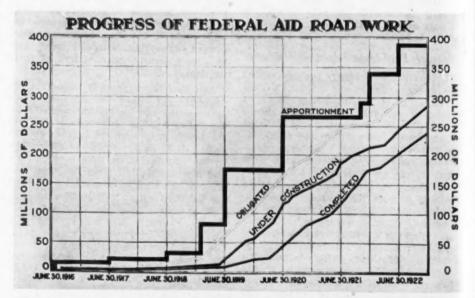
Contents: I-The Internal Combustion Engine. II-Multi-Cylinder Engines. III-Details of Engine Construction I (Cylinders, Crankcases, Crankshafts). IV-Details of Engine Construction II (Pistons, Piston Rings, Connecting Rods). V-Details of Engine Construction III (Valves and Valve Mechanism). VI-Automobile Engine Fuels. VII-Principles of Carbureter Construction. VIII-Modern Automobile Carbureters. IX-Modern Automobile Carbureters II. X-Carbureter Adjustment and Control. XI-Intake Manifolds. XII-Gasoline Feed Systems. XIII-Engine Cooling. XIV-Engine Lubrication. XV-Modern Automobile Power Plants.

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York.



MILEAGE OF FEDERAL AID ROADS COMPLETED BY TYPES





This is a graphic presentation offered by the Federal Bureau of Roads to show the progress of Federal aid highway construction

Salesman Urges Dealer to Cut Tire Prices

Manufacturer Probably Does Not Approve, But District Manager Is Looking Only for Volume

Should a tire dealer heed his own good sense, or do as the factory district salesman advises him? This question is raised in the letter which follows. This letter came to Motor Age unsolicited. The writer represents a large tire company and is credited commercially with a large turnover. He raises some very interesting questions, aside from that as to whether the dealer should follow the cut price advice of the salesman. This man predicts general tire price cutting May 10 when

the advanced dated bills come due. He suggests that the public retail price list be done away with. He charges that factory representatives see only volume, also that there is no co-operation to put tire selling on a more permanent basis.

This man's letter is based on his personal experience. If his experience is typical, it is no wonder that tire selling is demoralized. The frankness of this letter makes it clear why this dealer's name should not be used:

I N your Feb. 1 issue of Motor Age I read your editorial on "Tire Prices" with much interest. I note that you say that, in the past, many tire dealers have thrown away their profits in cutting prices. It made no difference how much margin the factory gave to them under the advertised prices, as when a customer came along and told them the man in the next block was cutting prices, the dealer cut, too.

In answer to this I wish to say that I have had an experience of about four-teen years in the automobile tire and accessory business, part of that time as territory salesman for one of the so-called Big Four companies, selling a general line of tires and accessories, and for the past two years I have been in the retail tire business. My observation has been that when a customer says that a dealer in the next block is cutting prices, it is generally so.

Customers Always Get Cut Prices

I have never seen a case where a customer going into a store with cash in his hand and expecting a tire at a reduction, didn't get what he was after, whether it was five or ten per cent off for cash or the dealers' discount, because his uncle, aunt or cousin was connected in some way with a wholesale hardware or grocery house who could buy tires from the factories at the same price or lower than the regular tire merchant can. The dealer, therefore, in turn sells them at wholesale prices to this customer. This is one reason why the legitimate tire merchant has in some cases to cut prices or lose customers.

The factories seem to be passing the buck and trying through the different motor and tire papers to unload the cause of all the price cutting on the tire dealer.

Let me cite you one case.

Some time ago I was selling one of the very popular and nationally known tires. A competitor was selling the same line. He advertised his tires at a cut price. Naturally, to sell my tires, I had to meet the cut or wait until he sold out or stopped his sale. I wrote the district manager of this company and advised him of the condition here. He came, in-

vestigated, and advised that I could meet the other dealer's prices without losing money, and that I would sell more tires. In other words, he encouraged the idea, selfishly looking to the volume he would get on his tire, regardless of whether the dealer made any money or not.

This seems to be the attitude of a majority of the salesmen. I don't think that the factory encourages this, but in their drive for volume they are making every effort to get their tire over, and all you hear is price and how cheaply it can be sold. They tell the dealer how much money he can make with a big turnover at a small profit. In many cases they sell this idea to the dealer. After operating a while on a small margin of profit, the dealer can't go on. He then goes out of business and sells his tires at cost.

I quite agree with you that it requires some intelligence to make money in a merchandising business. But don't you think that a little intelligent co-operation on the part of the factory with the dealer would eliminate some of the price-cutting? They should have their men sell tires by talking quality rather than price. Show the dealer that he must get a price for his merchandise—that will permit him to stay in business and make money. Educate dealers to be better business men.

As you say, now that we have the advance and a longer margin of profit, it will be interesting to see what happens. To me it looks like a repetition of the last few years. The dealer who was loaded up with tires on the five-month dating proposition will begin to unload about May 10 to pay his bills. The new price will be cut and the old one badly bent before they get through.

These dating propositions are a good thing for the factories, but for the dealer it is another means of making him cut prices.

It seems to me that the cause of all this trouble is the price list. Now if we did not have a price list, we could not cut it. Why can't the tire merchant buy his tires the same as the shoe or clothing merchant buys his? Let the factory give the tire merchant a cost price. He

can then fix a margin of profit on which he can operate and make his own list price. If this were done, this howl of price-cutting would be gone forever.

The factory does not want this called a tire game. If it is not a game, what is it? Will appreciate an answer from "Squeaks and Rattles" regarding it.

Very truly yours,

By T. B. S.

Doing One Thing Well

THERE is a right way to do a job of welding an automobile frame. Probably most important of all is the work necessary in preparing for the welding operation.

If the side rail is split so the bottom flange has a gap in it, the frame must naturally be raised at this point so the gap will be closed and the top of the frame will be horizontal. A sagging frame due to a split in the side rail allows the body to drop and the doors to bind.

To do the job right the body ought to come off the chassis. This entails a lot of work usually and the customer ought to be told of the fact so he will understand what to him would otherwise appear an excessive bill for the work.

If the weld is made with the body in place, a poor job is bound to result. We recall a case where a frame was welded and a reinforcing piece slipped over the outside of the side rail. The body was partly hoisted but the workman could not get at the job well. He literally dumped gobs of the welding material on top of this reinforcing piece and when the body was again dropped in place the doors had wide gaps and the hood fitted very poorly because the body did not line up as formerly.

The weld, although crude, held all right, but at the expense of a good fitting body, doors and hood. The job of trying to remedy this condition probably would run into more money than if the body had been completely removed and the workman been able to support the work properly and weld in a position where he could get at the job easily.

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Can a House Organ Pay You a Dividend?

How the House Organ Can Be Utilized to Aid You in Making Sales and What It Will Cost You

By JAMES V. MALONE

O what fields is the house organ limited? Who can afford to publish a house organ and to what uses can it be put? These questions and their answers will interest automotive dealers who are interested in getting to their customers in a more general and convincing way than by newspaper advertising or sales letters. Dealers in various parts of the country have already tried this medium of approach and found it successful.

While the individual publication by no means replaces the newspaper ad or the sales letter, still, if handled rightly, will often prove the finishing touch to the work done by these two accessories to sales. It is something more than either

the ad or letter because you can effect an easier entrance with it and it is slightly more valuable than the salesman because it is readily granted an interview with any one.

Some dealers consider the preparation of advertising and letters a "problem" and this is simply because they refuse to "see the light."

As a matter of fact, writing "copy" for your ad is simply saying to the customer in printed words, the same thing you would say if you talked to him in person. The work of dressing your ad in its "Sunday clothes" is an easy matter. After you have written what you want to say, hand it to someone and get their suggestions, correct it and send it on its way.

The house organ offers a new avenue to sales but it must be handled rightly. First of all, it must be made to pay a dividend and this can be accomplished only by the proper effort, which is not, in any light, "difficult."

If you cannot prepare your own advertising copy and your letters, then the one who does, unless he be actively engaged in business with you and knows as much about it as you do, will not do you justice. The preparation of "copy" for the house organ, however, is some-thing different. To begin thing different. with, it is "your own publication"—that feeling of ownership that makes you so particular about your business and your home, will be the first thing you experience about a house organ. You will find it easy to accumulate enough good copy to make your paper "come to life" and keep it an actual power in your community.

The Purpose of the House Organ

For years, the houes organ served only as a paper published by big firms for their employes but it soon moved from the liability column to the asset side of the books and now is in pretty general use as a friend and sales maker by firms engaged in all lines of business. Nor is it new, to the retail automotive field for, as has been said, many dealers have used it to their own advantage and found that it was a better sales force than a lot of the newspaper and letter work they were

The publication of Muller Bros., in Hollywood, California, offers an example of how the house organ has helped. They publish a little four page pamphlet every month called "The Air Hose" and on these pages is reproduced the first leaf of one of their issues. It is printed in black and red throughout and is a little better than half the size of Motor Age pages, 9 ins. by 6 ins., to be exact.

Another example of a paying house organ is the F. B. Connelly Co's. Service Bulletin published at the company's of-

fices in Billings, Mont., where they are agents for the Ford company. This. too, is a four page paper and is 12 by 81/2 ins.

Still another example of the house organ is "Motor Topics," published by the Simonds Motor Co., of Zanesville, O. The Simonds company has gone a little farther into the publishing field than have the other two firms, the Thanksgiving number of their paper being 16 pages.

All three of these house organs are splendid examples of what makes a paying publication for the deal-They go farther than the shop and office in making friends and can be used in the mails as a means of reaching old customers and prospects, constantly reminding them in an interesting manner that you are there to serve them.

The preparation of the reading matter is a thing which requires some little thought because it cannot be either of the stereotyped newspaper ad style nor of the sales letter caliber-it must be distinctive. Humor is the agency that has made many of them successes, but the house organ should not be filled with trashy material.

A glance over the three publications listed above, gives a pretty good idea of what kind of copy goes to



NOVEMBER, 1922

Hollywood Gets a New Hospital

Muller Brothers Motor Sanitarium and Clinics WALT MULLER, Chief Surgeon. FRANK MALT MULLER, Chief Surgeon. Consultation—FREE—Examination

THE World's Greatest Service Station will hereafter be operated as an automobile clinic, sanitarium and general hospital. We have gathered together a staff of service specialists that are capable of diagnosing and curing any automotive affliction from chills to chillblains. ing out with more patience than any similar insti-

tution in the world.

This new institution will be operated upon a distinctively modern plan. Patients will write their own prescriptions for gas, oil, tires and accessories, and we'll fill them right on the job. Every aliment will have its own individual clinic except this goat and monkey gland business. Somebody got our goat and we won't tolerate any monkey business, so we draw the line there.

Cars that are only temporarily indisposed, auch as those with under-nourished gas tanks and inflammatory crankcases will be treated promptly by the interns on the gas pumps. Other afflictions will be ministered to in the following group of ethical clinics:

Office Hours 6 A. M. to 10 P. M.

TIREOPRACTIC

Torn fabries and misplaced cords will be treated with Tirepractic adjustments in the rubber clinic.

Corns, bunions, barnacles and bruises taken off and Hood Tires put on. Expert in the rubber clinic.



Social Calls by Appointment.

SQUEAKOPATHIC

Organism deficiencies scientifically treated by applications of healing oils, salves and ointments in the greaze clinic.

SURGICAL
Major and minor operations performed upon tires of any sex, size or specie, for fractures, tumors, tape worms or contusions. No anaesthetics. No serious after effects.

The front page of Muller Bros. "Air Hose" for November. It is printed in black and red, is 6 ins. wide by 9 ins. high, printed on four sides and costs about \$60 a thousand copies for the printing, and stock. Note the novel way the name is presented

make up a successful house organ. In each paper there is a distinctiveness of matter that sets it aside from anything the reader is likely to receive and yet it is simple enough to guarantee that everyone will read it.

In the case of the Simonds company and Motor Topics, a plan of composition has been followed which makes reader interest certain. On the first page of the November issue is a drawing in pen and ink of a Pilgrim and his wife going to church, underneath is the caption, "Simonds is Thankful—Are You? And on the following page, set off in the manner shown right in the center, is this "box":

Absolute Satisfaction

Must Be Included With Every Purchase at this Store—On this depends our Success.

A simple reminder to Simonds customers and prospects that they are the first thought of. Directly under this in the same column is a picture of a man removing the oil from the crankcase with the caption, "It's an unpleasant job but it's necessary and we'll do it for you FREE." Follows a short item on the importance of changing lubricant. The rest of the page is made up of a poem and an editorial. The poem is called "Thanksgiving Day" and the editorial has to do with a guarantee.

On the next page is a question and answer column devoted to the owners' automobile problems and one or two other features, dealing in an interesting manner with Simonds service. Lines like these are set at the bottom of each page, "It's Not the Cost to Buy But the Cost to Use That Counts," "Extra Spark Plugs Are as Necessary as Extra Tires," "Simonds Service Satisfies," "It's Worth Having If We Have It," and others, all telling briefly of the value of Simonds service.

Beyond doubt, the reason for the success of Motor Topics is this spirit of brevity which is carried through all the way. A few "Don'ts for Winter Driving" are printed, a table telling of the use of anti-freeze solutions, a full page ad on General Tires, a place for readers to express their opinions, plenty of illustrations, a tire repair department column with tips on how to fix minor tire and tube injuries, a humor column, "Hot Sparks," wherein some rattling good jokes are printed and a column devoted to "Jap's Auto Laundry," Jap being the colored attendant in charge of the laundry department.

All these departments and features are so written as to be brief and yet contain enough reason and punch to get them across.

In the case of the F. B. Connelly Co., their Service Bulletin presents quite another type of publication which is every bit as interesting as Motor Topics, though not as large. It deals mostly with Ford news and on the first page,



Let us help you select useful Christmas Gifts. In our store you will find gifts that will bring Christmas morning delight to every motoriat, gifts to fit every pocketbook. Come in and look around.

GIFT SUGGESTIONS:

A Set of Tire Chains
A Set of Wrenches
A Towing Cable
A Radiator Cover
A Flashlight
A Tire Pump
A Set of Spark Plugs
An Emergency Kit
A Spot Light
A Stop Light
A Motor Meter

A Running Board Mat
A Spare Tire
A Tube
A Tire Repair Kit
A Bumper
A Windshield Wiper
A Rear View Mirror
A Service Unit
A Tire Covers
A Set of Seat Covers
A Hydrometer

Our Service includes the wrapping of Automotive Gifts in Christmas style and their delivery if it is wished.

F.B. CONNELLY COMPANY

423 N. Broadway

A Winter Heater

Telephone 6853

An ad from F. B. Connelly's Service Bulletin. Note the arrangement of the list of gifts. A person glancing over the pages of the Bulletin is not likely to pass up this insertion as it is made easy to read by the composition

tells in news story form of how "Increased Production Makes Possible Further Decline in Prices of Ford Cars" and "New Ford Model Announced." the same page is an editorial by Dr. Frank Crane on "Clean Business," pointing out the value of conducting business on a fair and square basis. On the second page is an ad telling of Connelly's gift suggestions, laying them out in a manner easy to read and hard to pass up without reading. The humor column of the following page, "A Smile a Minute," contains some new jokes which will get a laugh from anyone. "In a Nut Shell" is another department devoted to interesting bits of Ford news from all over the world. On the last page is the "Query Mill" for questions.

The Cost of Publishing the House Organ

Then there is the Muller Bros. "Air Hose" which presents still another type of reading matter and printing. It is printed in red and black throughout and in the issue of November, one complete story is carried almost throughout. In

order to devote a large part of the issue to one subject, a good idea was necessary and Muller Bros. have struck it: "Hollywood Gets a New Hospital" being the headline. The story then goes into detail on the various "clinics" of the hospital, such terms as "Tireopractic," "Oilopractic," "Dental," "Ambulance" being used. Each one designates a division of service and to show the idea carried, we print the following excerpts.

Under the "Dental" caption is the announcement: "Guaranteed painless extraction of nails, spikes, barbed wire, etc., from all makes of tires." Under "Beauty Culture" is printed, "Cars with bad complexions and general dissipation can be given the bloom of youth by a sponge bath and a chamois massage in the washing and polishing laboratory."

The difference between 28 miles per gallon and 28 miles per hour seems to be about three days in jail.

On the two center pages, are a number of jokes, snappy sales puns and two cuts.

In a later issue of "The Air Hose," Muller Bros. have proven that they can keep up the pace for snappy reading that they set in their previous issues. There are brief sales paragraphs through which are humorous and yet serious reminders that Muller Bros. are there to serve.

"Better buy a bumper before some truck puts a marcel wave in your car," is the way "Walt and Frank" explain the value of the bumper. Notes are largely local and apply to the movie stars and their habits. The "lead story" this month is "The Real Sins of Hollywood," in which The Air Hose explains that the citizens of Hollywood are all right but the real sin lies in the fact that so many of them neglect their cars.

Muller service is played up in such a manner as to make the Air Hose "sure fire" with even the great comedians who are residents of Hollywood.

The cost of publishing the house organ is, perhaps, the only item which is standing between many more dealer publications and the automotive customer. In the case of the Muller Bros. "Air Hose," a paper, which, as stated above is 6 ins. wide by 9 ins. high, should cost, including the paper and two-color printing, about \$60 a thousand copies. This price is given, not as the exact cost but an approximate price for the work.

"Motor Topics," the Simonds paper, which is a little over 10 ins. high by 8 ins. wide, with 16 pages, including cover, would cost between \$100 and \$125 for the printing and paper. These prices, of course, do not include the making of the cuts.

F. B. Connelly's Service Bulletin, the dimensions of which are also given above, should cost between \$40 and \$60 per thousand for the printing and paper. In estimating the cost of cuts, it might be said that the average cost of zincs is \$3 and half-tones \$5.

MOTOR AGE'S PICTURE PAGES



Window display of the Oldsmobile Company of Buffalo, N. Y., which won first prize in the nation-wide window dressing contest of the Olds Motor Works. A striking lighting effect was attained at night by illuminating the black backgrounds of the two cars with concealed lights. The only other lights in the entire display were on the Christmas tree



"Ford mules" are used for moving goods in New Orleans warehouses. They are speedy on the run with three loaded trucks, carry 8000 lbs., and quick-acting at turns. They are said to save half the labor cost of loading and unloading







Jack Jones, of Ormond Beach, Fla., left his "flivver" on the beach and went for a swim. No sooner had he turned his back than a big wave sneaked up and took the car for a swim also. The illustration shows the car after the wave had finished with it



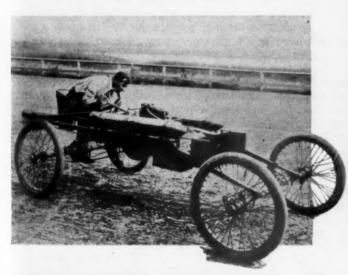
OF AUTOMOTIVE INTEREST



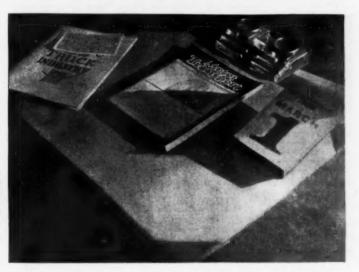
The Studebaker agency in Cleveland uses a novel window display. Signs like those shown here are formed from hand bills and the effect is one which attracts much attention and favorable comment



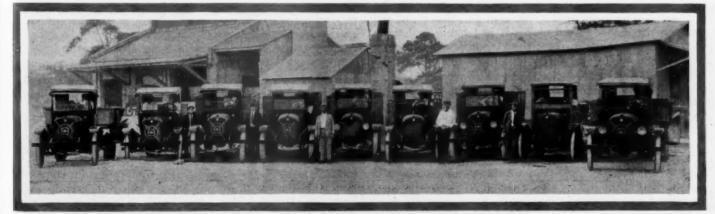




In March, 1903, the Oldsmobile Pirate, shown above, a famous racing car of those days, established the world's straightaway record, making five miles in six and a half minutes. That same year saw the first motor car to travel a straight mile on Ormond Beach in less than a minute



"Motor Transport" is the new name for the Class Journal publication known as Commercial Vehicle. The new title is regarded as more expressive of the field of this publication, which is published for the information of fleet operators. The new title was announced to the industry through a pamphlet, "What Is Wrong With the Truck Industry?" by David Beecroft, general manager of "Motor Transport"



Nine Ruggles trucks have been purchased by the city of Tampa, Fla., for the Public Service Department and will be used for street work and other public improvements



Vol. XLIII

Thursday, March 8, 1923

No. 10

THE CLASS JOURNAL COMPANY

Horace M. Swetland, President W. I. Ralph, Vice-President E. M. Corey, Treasurer A. B. Swetland, General Manager David Beecroft, Directing Editor

Mallers Building, 59 East Madison Street, Chicago

BUSINESS DEPARTMENT E. E. Haight, Manager

EDITORIAL Clyde Jennings, Editor B. M. Ikert, Technical Editor

DETROIT OFFICE

WASHINGTON OFFICE

BRANCH OFFICES

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Detroit—317 Fort Street, West, Phone Main 1351

Cleveland—536-540 Guardian Bldg., Phone Main 6432

Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189

Indianapolis—1212 Merchants Bank Bldg. Ph. Circle 8426

Boston—185 Devonshire Street, Phone Congress 4336

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			SUB	SCRI	PTION F	RATES				
All O	her Cour	ntries in	Postal	Uni	on			_ 6.00	per	year
	Subscri	ptions a	accepted	onl	y from	the	Automotive	Trad	e	

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.

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Tire Prices

N a recent editorial in MOTOR AGE we pointed out the spread of tire prices for a certain size of tire. The highest price quoted from the Tire Rate Book was about 300 per cent greater than the lowest priced tire appearing in this list. .The opinion was expressed that the quality of the tires did not justify such a spread.

Another chapter on this point has just come to us. A man familiar with dealer discounts on tires generally, asserts that the dealer price does not show anything like this 300 per cent spread. This man says that the difference between the lowest and the highest dealer price on tires will not be more than 50 per cent and the rest of the price on the higher priced makes it just bunk-put there to permit the dealers in these tires to quote a discount to his customers.

In other words, according to our informant, most of this spread is put into tire prices by those manufacturers who believe that the way to sell an article is to put on it a very high price and then make the customer believe that he is being given a very special favor by being permitted to buy this tire at half price.

There was a time when this practice flourished in many lines of merchandising. We all remember when the clothing merchant did that very thing. The shortsighted merchants who followed this practice have learned better, however. They learned because their very best customers

-those who came, looked and bought, paying the price asked and making no fuss-quit them and went to the one price houses where they were sure they were on an equal with others. It is a fact, too, that the customer who is favored with discounts also quit because he believes some other customer gets a bigger discount than he.

It is strange that so up-to-date an industry as tire manufacturing should be working on such benighted and obsolete methods of sale.

A dollar made selling accessories is just as good as the dollar made underneath the car.

88 36 BR

Used Car Market Information

N all of the used car sales talk that has merchandising as its basis (and this is the only kind that is ever going to get anywhere) the necessity of a national market publication has been stressed. It is a part of the education of a dealer who would properly handle used cars that he must know something of the market price for these cars, not only in his own community but throughout the country generally.

For many years the Chicago Automobile Trade Association has published The Used Car National Market Report, based on actual sales of used cars. This report has had a fair circulation but it has never attained the popularity that it should have had, chiefly because the dealers of the country have not understood its necessity or its application to their own business. In many cases dealers have not understood how to use this valuable document

This Report has been the best thing of the sort available and what has been lacking in it is the support of the very men who should be most interested in making it more complete. It has been a part of the agreement that a subscriber to this Report should make returns on his own used car sales. This has not been done by all dealers. As a result, the Report has not been as complete as it might have been.

Most of the local plans for spreading market news of used cars are for a limited community only, and the makers of these reports are quite free to say that they need a national market report on which to base their local information. The two work nicely in conjunction and neither is complete without the other.

The Chicago Automobile Trade Association pioneered this work and the publishers have endeavored to keep up with the necessities and where they have failed, it has been due to a lack of dealer appreciation of the necessity of this publication. The committee in charge is willing to develop the proposition just as rapidly as dealers will lend support.

At all times during the history of this Report, there have been efforts by individuals to devise a substitute that would make a profit for promotors. These attempts to make money out of the used car difficulties of dealers who fail to grasp the merchandising fundamentals of the situation, have failed. Not enough dealers are unwise enough to believe that they can, for a few dollars, buy a solution of the used car problem.

Just now there is another rival of the National Used Car Market Report in a private enterprise which is sailing more or less under false colors. This new enterprise appears at first glance to be a part of the National Auto-mobile Dealers' Association, but in reality has no connection with that association. Its activities apparently are based on the work the N. A. D. A. is doing in making used car surveys. These surveys are calculated to bring out only actual merchandising conditions and have nothing

to do with market prices.

The prosperity of the automotive industry is bringing many catch-penny schemes to light, including some pretended national associations. The industry should inquire carefully into the history of the men promoting these new enterprises and be very sure that the new enterprise is worthy of support.

N 2 %

Get thoroughly acquainted with the cars left in your garage.

Dealers Ignore Profit

HERE is a curious indictment of the automotive vehicle dealers, from a man who made his best effort to present small town dealers with some handsome profits, but failed utterly. He tried the usual methods of interesting dealers.

The proposition was to sell a school motor bus body. This body was built so that it would fit almost any sort of a truck that would be used for this work. Seven trucks are especially named as the proper chassis for this body. The maker thought there should be a sale for these bodies and so he naturally tried to get automotive dealers to sell them.

After making this effort, he tried out the so-called township supply, or school supply houses. These men jumped at the opportunity and the factory has had quite a nice demand for these bodies. A lot of school supply firms have sold them, have hired some automotive dealers to mount the body on a chassis and then have had a nice profit left.

There is a good deal of complaint from small town automotive dealers that they cannot make money. One reason is that other merchants are selling the goods the

automotive merchant should sell.

30 Th 38

The number of cars has multiplied 100 times in 16 years. Better and wider roads are needed for safety.

26 E 38

Batteries and Cleanliness

HERE are some interesting questions that we would like to have answered but of which we have only slight hopes of ever hearing or seeing a satisfactory reply. One of these is quite often heard. It is this:

"Why are battery shops so dirty?"

Our idea of the answer to that question is that the battery man has never been educated in the proper methods of merchandising and that, in the main, he does not believe that it is worth while to keep his place clean. It is a fact that the battery merchant has a good deal of company in his mercantile uncleanliness. There are a few hangover merchants in all lines who let their store windows become dirty and who seldom if ever sweep the floors, but this class of merchant is becoming less and less important. It is only a question of time until he disappears.

It is not a long span of years since the dark and confused store was quite the common thing, even in the drug and dry goods lines, which are held up as notable examples of bright clean stores. The battery merchant, in most cases, is a graduate from the shop and there is a slight excuse for a battery shop that will not pass a sanitary kitchen examination, but not as much of an excuse as a good many people would like to have us believe. The fact is that there are quite a number of clean battery shops, as

the writer can testify. This fact merely goes to show that the man who defends a dirty battery shop is mistaken, and we further assert that there is no excuse for the dirty battery store.

There is in Chicago a battery merchant who is paying premium rent for corner show window space and two thirds of this space shows a dirty shop. In other words, he is paying premium rent for a means of driving customers from his store. It is a common failure for battery merchants to rent a wide front store and then use half of this window space for a work bench, that is, to say the least, decidedly unattractive.

The same rules that hold for other merchandising hold for batteries. A clean, wholesome looking store will attract customers.

28 T 32

The automobile makes 50,000,000 people healthier, wealthier and happier.

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Profiteering?

THERE is a popular song, recently slipped onto the public, which is called, "Who Did You Fool After All?" which might be applied to the garage business in a certain section of Chicago. This condition not only exists in Chicago, but, we believe, can be found in many cities throughout the country.

It is in the apartment house district, where modern cliff-dwellers cuss about "hot" water on cold mornings. According to our informant, there is a shortage of storage garage space in these sections. Space which a few years ago sold for from \$12 to \$15 a month now retails at from \$18 to \$22. The burning question here seems to be, is it profitable and necessary for dealers to charge this fee for "boarding"?

The answer is this: Our informant and many others do not own cars because it costs too much to store them. Figure it out. If storage fees were brought down, there would be more sales of new cars and the storage customer would be there as an always-approachable prospect for accessories, tires, service, gas, oil and eventually another new car.

By which route would the dealer make the most money?

32 T 36

Obey the traffic laws. The man who makes them probably owns a car and has studied the requirements.

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Tut's Tomb

THE newspapers tell us that Egyptian jewelry and dress styles are to be quite the rage next season, or as soon as the dressmakers and the jewelers can get out their adaptations of the garments and jewels that have been found in King Tut's tomb. These styles are to be

very chic and quite stunning, we read.

It so happens that along with the jewels and garments, there were found in this tomb a number of Tut's transportation vehicles. We do not, however, anticipate that the styles in individual transportation vehicles will be greatly changed to conform with the styles in vogue when this ancient ruler was buried. Ours is a dynamic industry and we will not lapse back several thousand years for our late summer styles. About the only thing in common between the vehicles of today and that of King Tut's time is that the wheels are round, and probably this style will continue for several more years.

Great Rubber Rise Worries Industry

Leaders Meet at Washington To Discuss Relief Measures

Result of British Colonial Export Tax Laws Said to Cost Motorists \$160,000,000 a Year

WASHINGTON, March 3—Suggestions for combating increases in automobile tire prices through a rubber shortage were adopted here this week as a result of conferences between representatives of automobile and accessory manufacturers and others interested in rubber productions.

There was a complete unanimity of opinion as to the need of repeal of the provisions of the British Colonial Act restricting rubber production and the urgency of providing new sources of rubber supply for American tire manufacturers. The automobile industry will have representatives on the committee of five which Harvey S. Firestone of the Firestone Tire & Rubber Co. will name this week as a co-operating agency for the manufacturers and consumers in their relations with the Federal departments. It is proposed that this committee should assist the Government in a study of the rubber situation, with a view to growing rubber in continental United States insular possessions.

The most important emergency measure which the conference authorized is the protest to British Government. It was the sense of the meeting that a continuation of the present restrictive taxes by British producers would place the automobile industry, as the largest consumer of rubber, in a position where it would find itself confronted with rising costs of tires.

A resolution adopted by the conference points out that the costs of crude rubber at Singapore increased over 14 cents to about 37 cents. The fact that this increased price must be passed on by rubber manufacturers, shows that the action of British Government has cost American rubber consumers approximately \$160,000,000 a year.

American and British tire manufacturers in attendance at the conference called attention to the possibilities of further increases in tire prices, as there is no assurance that prices of raw rubber will not be further increased.

Senator Couzens of Michigan, formerly identified with the automobile industry, was one of the speakers at the dinner given by Firestone Tuesday night. While approving of the proposal of governmental aid to the rubber industry in this instance, the senator declared it was high time that the Federal Government defended itself against business. He said that it was a deplorable practice for industry to turn to the Government when confronted with trouble.

Senator-Elect Fess of Ohio declared that inasmuch as the proposed survey and establishment of new rubber sources was a benefit to the consuming public, there could be no objection to it. He expressed the opinion that there is a tendency on the part of the industry in general to centralize, and the Government must be in a position to control. Among the representatives of the automobile industry in attendance at the conference were George M. Graham, vicepresident, Chandler Motor Car Co.; W. H. Smith, research engineer, Ford Motor Co.; Pyke Johnson, National Automobile Chamber of Commerce; Gordon Lee, Yellow Cab Co., Chicago; M. L. Heminway, Motor and Accessory Manufacturers' Association; G. W. Brogan, of Black & Decker Mfg. Co., Baltimore.

Rubber Can Be Grown in South, Says Wallace

WASHINGTON, March 3—Rubber can be grown successfully in the southern states, in the opinion of Secretary of Agriculture Wallace, who with other government officials has been studying the possibility of American production to circumvent the British export tax on rubber. Part of the cabinet discussion today turned on plans to investigate American sources of supply. President Harding is convinced that rubber can be grown in the Philippines and Porto Rico.

MANY SALES AT AKRON SHOW

AKRON, O., March 1—Akron's ninth annual automobile show opened Feb. 17 at Central Garage with 63 exhibitors having more than 250 exhibits valued at \$500.000.

As indicative of the returned conditions of prosperity in Akron, more automobiles were sold on the first day of the show than have been sold during the entire time of any previous automobile show held in the Rubber City.

The Akron show this year was under the management of Frank O'Neil as business manager for the Akron Automobile Exhibition Co., of which Warren Wright of the Cleveland Cadillac Co. is president.

RUSH PRODUCTION ORDERED

PONTIAC, Mich., March 2—Rush production in the Standard Auto Parts plant here, making springs, has been ordered to begin at once, according to B. A. Litchfield, general manager. Litchfield says that immediate expansion of production is being undertaken and a new unit of the plant has already been started, but that delay in getting materials is causing some difficulty.

Hoover Tells Why America Should Produce Own Rubber

Informs Congressmen of Danger in Being Dependent Upon Foreign Growers as at Present

WASHINGTON, March 3-In making his appeal to the House Committee on Appropriations for the \$500,000 desired for the purpose of investigating the possibilities of rubber production in the Philippines and Brazil, Secretary of Commerce Hoover has personally told the committee that foreign control of such important commodities as rubber and nitrate constitutes a menace to American consumers and that steps should be taken to provide for the safety of the nation in time of war and to protect the pocketbooks of consumers in time of peace, as such foreign monopolies were able to control prices as well as production.

Hoover not only spoke strongly on the rubber situation, but openly declared he would like to see Henry Ford develop Muscle Shoals for making nitrates.

"I do not know whether Ford's terms are the terms Congress ought to adopt," said the Secretary of Commerce. "I could not speak as to that, but I would like to see anybody who has the capital take Muscle Shoals and turn nitrates out of it tomorrow."

Turning to rubber, Hoover pointed out that this country is importing about 500,000,000 pounds of rubber a year and that every change of ten cents in price means \$50,000,000. "If we are to have security in our supply of rubber, we must have at least competitive production in different countries," he added.

"We are assured by the rubber manufacturers here that if our survey results in the conviction as to some appropriate or feasible places for the production of rubber, they are prepared to enter at once with large capital into its production," he continued.

Referring to the recent conference between the English rubber growers and the Rubber Association of America, Hoover stated that the British were told that "we were the consumers of 75 per cent of the world's rubber; that that consumption would increase if right prices were to obtain, and that runaway prices would ultimately stimulate rubber production in other parts of the world and would probably result in ultimate damage to the plantation owners themselves."

RECEIVER FOR CARLISLE CO.

NEW YORK, March 2—Robert L. Baird has been appointed ancillary receiver of the Carlisle Tire Corp. and the Carlisle Retail Tire Stores, Inc., by Judge Hand of New York and Judge Campbell of Delaware.

Unit Truck Service Plan Adopted

Many Motor Vehicle Bills Before Iowa Legislature

Some Kind of Gasoline Tax Certain to Be Voted On, Is Belief of Motorists

DES MOINES, Ia., March 2-With many bills affecting the motor industry before the state legislature, it is almost certain that the present assembly will pass some kind of gasoline tax. Sen-ator Caldwell's bill would provide for a 2-cent tax upon gasoline to be collected from refiners and distributors, to be applied only to the hard surfacing of 3,000 miles of roads included in the primary trunk system. The bill also would amend the primary road law of the state and allow \$1,000 to each township and \$5,000 to each county annually for the purpose of improving local roads. Revenue from this bill is approximated at \$6,000,000 annually.

A bill introduced by Representative Ontjes would provide for a tax of one cent a gallon on all gasoline, the tax to be collected from retailers, and a license fee of \$2 to be paid by each dealer in addition to the tax. The revenue from this law would be distributed over the state in the same manner as now provided for the apportionment of the motor vehicle fees. The latter bill is being combated by the Iowa Automotive Merchants' Association on the grounds that it would tend to create a monopoly in favor of the large oil companies.

The Iowa Automotive Merchants' Association has sponsored a bill providing for equalized license fees for automobiles based on current year price. For cars not current or "orphans," the license fee would be the lowest fee for such automobiles shown by the records of the automobile department covering such makes or models. The I. A. M. A. bill would provide for a reduction of automobile fees on the following basis: First and second registrations, full fee; third registration, three-fourths of one per cent of factory list price plus 40 cents per hundred pounds; a reduction of onefourth of one per cent of that portion of the fees based upon factory list price each year until the sixth and subsequent registrations, when the rate would be only 40 cents per hundred pounds of weight regardless of model of the car.

The I. A. M. A. is seeking the repeal of garage registration section of the present motor vehicle law. At the present time, all dealers or owners of service stations are required to keep for public inspection a record of the owner of every motor vehicle taken in for storage, repair or sale, together with the engine and license number of such vehicles. The law was originally passed to help authorities find stolen cars, but garage-

men claim that no aid is given officials by such records and the keeping of such records is a useless expenditure of time and money.

Says Automobile Dealer Is Big Equipment Sales Factor

BOSTON, March 2-At the monthly meeting of the Boosters Club, N. E. No. 1. held at Boston, plans were discussed to bring about closer co-operation with the jobbers and better merchandising. The educational committee provided two speakers for the evening. E. J. Ashton. formerly a Boston jobber, spoke of the need of better merchandising methods by the salesmen of the jobber in the equipment and supply field. He emphasized the value of the passenger car dealers as an outlet for equipment, and said they were fast becoming a factor in distribution. C. P. Shattuck, field editor, Chilton Company, read a paper on the markets of the industry and made an analysis of the New England markets for trucks, passenger cars and equipment. Several new members were elected. The committee on the entertainment for the annual meeting reported progress.

3000 AT DEALER'S OPENING

SALT LAKE CITY, March 3—About 3000 persons visited the new home of the Covey-Ballard Motor Co., local Ford and Lincoln agents, when the fine new building costing over \$300,000 was formally opened for business. The showroom was decorated for the occasion and experienced workers demonstrated features of each department as the visitors passed through. Even the office system was explained. The building has three stories, is one-half block long and 83 feet wide with a floor space of 90,000 ft. The storage department has a capacity of 600 cars.

ASSOCIATION GAINS MEMBERS

KEENE, N. H., March 3—The Cheshire County Automobile Dealers' Association has celebrated its first anniversary. It was organized a year ago with ten members and the membership is now forty-two. The following officers and directors have been elected: President, L. E. Roundy; vice-president, G. F. Fairfield; secretary, P. F. Safford; treasurer, K. A. Watkins; directors, A. P. Bergeron, G. B. Robertson, F. Dugray, C. W. Houghton and John D. Heil.

ELECTION AT KEWANEE, ILL.

KEWANEE, Ill., March 5—The Henry County Automotive Trades Association, at a meeting attended by 100 dealers, elected the following officers: President, C. F. Moberg, Geneseo; vice-presidents, Frank Brown, Osco; Herbert White, Cambridge, and Homer McMullen, Cambridge; secretary, G. R. Galloway, Kewanee; treasurer, Phil Miller, Kewanee; directors, John Cummings, Galva; J. O. Hoffman, Kewanee.

No Vehicle of Standard Parts Need Be "Orphan," Is Keynote

Builders and Parts Makers Unite in Step to Provide Special Tools and Equipment to Reduce Cost

DETROIT, March 3—Service plans of Motor Truck Industries, Inc., as worked out by the service committee of the organization, provide primarily for the development of special tools and equipment to place servicing on the highest possible basis of efficiency; for the development of reciprocal service arrangements between members of the organization, and for cultivating co-operation on service between dealers of the different manufacturing organizations.

Though designed fundamentally to help dealers rebuild and sell stocks of used trucks they may have on hand, the service plans of the association extend far beyond this and are intended to place the maintenance of specialized unit vehicles on a permanently stable basis. In the working out of the plans, servicing costs will be brought to lower levels by more scientific working methods and merchandising.

In clearing off remaining used trucks stocks, the different truck manufacturing members of the association will get reports on all trucks in the hands of dealers from field representatives and through questionnaires to the dealers. Following servicing of these, their sale will be further facilitated by handling them through the authorized dealer in the specific make, this to be brought about by development of reciprocal dealer arrangements.

The service committee and the association as a whole will work toward bringing about closer co-operation between dealers and the authorized unit parts depots of the parts makers. In the several groups of parts depots practically every unit maker member of the association is now represented, and these depots with stocks running into the millions of dollars are now located in all principal cities of the country and greatly augmented stocks are maintained by specialized truck dealers.

By the operation of the parts depots, the association points out, it will be impossible for any make of truck made of specialized units, to ever become an "orphan." Extension of the parts stations has been gradually effected so that genuine parts at fixed list prices are available in every part of the country. All of these parts will bear the trademark of the manufacturer.

"The thought of combatting pirate parts does not enter into the plans of the association," said Don F. Whittaker, general manager. "Most of the big truck

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No Vehicle of Standard Parts Need Be "Orphan," Is Keynote

Builders and Parts Makers Unite to Provide Special Tools and Equipment to Reduce Cost

(Continued from preceding page)

users have had experiences with these and where they were found lower priced it was because workmanship, design or material was inferior. By trademarking the genuine parts there will be no reason for truck owners accepting any others, especially when the genuine are within reach at dealers or the parts depots."

Better Service Is Duty to Truck Owner

In working out its service plans the association has sought to avoid the thought that service parts business presents an opportunity to make money, but rather, that adequate service at low cost is an obligation of the manufacturer and dealer to the truck owner. With the unit parts maker co-operating there is added a further factor of responsibility for the successful operation and maintenance of the vehicle.

Developing of special tools for specific service operations will be done by a tool specialist employed by the service committee. Sets of these will be offered to dealers at low cost through their truck manufacturer. Some of these tools have been designed and the remainder will follow just as rapidly as they can be worked out. By use of the sets repair operations on all principal specialized units will be brought to a minimum cost.

Under the reciprocal arrangement among manufacturers, dealers with any specialized unit make of truck on hand will be enabled to get necessary parts for its rebuilding from the manufacturer of the particular vehicle at low cost. This will be handled through the service department of the factory the dealer represents, and the service department of the particular vehicle he needs to rebuild for sale.

The service committee will meet every 60 days for action on service matters affecting the association. The members of it are George H. Dow, Federal Motor Truck Co., chairman; Don Andrews, Continental; O. P. Bernhart, Timken; M. Kiefer, Buda; M. A. McCullough, Garford; H. J. York, Indiana. The next meeting will be in April.

Urge Standardized Accounting Systems

In addition to the work outlined, the committee will undertake to bring about a definite ruling by the Internal Revenue Department on excise taxes imposed on service parts. The adoption of standardized accounting system for dealers which includes accurate records on servicing will be urged. The committee also placed itself on record as opposed to the replacement of any unit in a vehicle with another unit not standard equipment.

New York Dealers Plan Campaign to Curb Accidents

NEW YORK, March 6—An educational campaign to reduce the number of accidents involving automobiles and to create good-will for the industry is being contemplated by the Automobile Merchants' Association of this city. Although the details of the plan are not settled at the present time, it is probable that attention will be directed first to the automobile driver. This phase of the campaign will endeavor to get the individual driver to exercise greater care in the operation of his car. A second phase of the campaign will endeavor to educate the pedestrian on the part he can play in reducing accidents. Newspaper and direct mail advertising will be used to carry the message of the campaign to the puglic. The metropolitan dailies have promised their co-operation.

Auburn Current Assets Exceed \$1,400,000; Error Corrected

Current assets of the Auburn Automobile Co., Auburn, Ind., were erroneously given as \$191,891.51 in a news story in the March 1 issue of Motor Age, summarizing the company's annual financial statement.

The figure quoted represented only the company's cash in bank and was but a small portion of the current assets, the total of which amounted to \$1,405,910.41, including the following principal items: United States Treasury notes, \$203,062.50; accounts receivable, \$419,673.89; inventory, \$581,466.89.

As contrasted with the company's current assets of \$1,405,910.41, its current liabilities were only \$131,844.62, the excess of current assets over current liabilities indicating a very strong financial position.

FT. WAYNE SHOW

FORT WAYNE, Ind., March 3-After it seemed as though this city wouldn't have an automobile show this year owing to the inability of the show managers to secure space, it was found that the Concordia College gymnasium was available and the best show yet put on here was staged by the members of the Fort Wayne Auto Trade Association. The exhibition was staged from Tuesday evening, Feb. 27, to and including Saturday, March 4. Twenty-six different makes of cars were on display and there were accessories and parts exhibits by eight different dealers.

The show committee consisted of Chester Schiefer, chairman; Roland Fitch, C. H. Lines and L. G. Andrews.

HAYNES INCREASES PRODUCTION

KOKOMO, Ind., March 1—Production at the Haynes factory has been increased one-third, according to an announcement by Alton G. Seiberling, president of the Haynes Automobile Co.

Gasoline Production In 1922 20 Per Cent Greater Than '21

Bureau of Mines Reports Total Output of 6,202,234,613 Gallons For the Year

WASHINGTON, March 2—Production of gasoline in 1922 increased 20 per cent over the 1921 output. Figures compiled by the Bureau of Mines show that the total production for the year amounted to 6,202,234,613 gallons. The output for December was the largest recorded for any single month, amounting to 585,049,677 gallons.

The present stocks of gasoline, 883,-792,861 gallons, lack only about 9,000,000 gallons of the peak stocks of last May 1, with probably four months yet of increasing stocks before reaching the peak in 1923. Based on the present rate of consumption these stocks represent 64 days' supply. Following out the present trend of gasoline stocks with expectation of the customary increase during the early months of the year, the stocks may be expected to increase between 300,000,000 and 350,000,000 gallons by May 1, thus probably totaling about 1,200,000,000 gallons. This increase in stocks may, of course, be decreased by a falling off in refinery operations the early part of this vear.

The indicated domestic consumption of gasoline during the past year amounted to 5,366,423,822 gallons, an increase of only 200,000,000 gallons as compared with the preceding year and an increase of over 1,000,000,000 gallons in production during 1922 over 1921. Domestic consumption amounted to 86.52 per cent of domestic production.

The production of lubricating oils in '1922 was 978,752,469 gallons. This output was exceeded only in 1920 when it was 68,000,000 gallons greater.

GREAT GAINS IN CALIFORNIA

OAKLAND, Cal., March 5—The automotive industry is having the most auspicious opening in California this year that it has had for any year in its history, according to figures compiled by "Motor Registration News," published in this city. These figures show that total sales of automotive vehicles in California for January, 1923, were 15,109, as compared with 6,694 in January, 1922, an increase of 126 per cent, the largest gain ever made in any single month of automotive history in California.

Of this total, southern California purchased 9,410, a gain of 115 per cent over its record for January, 1922. The northern part of the state bought 5,699 automotive vehicles in the first month of 1923, a gain of 147 per cent over its purchases for the same month last year. In passenger car sales the state gained 127 per cent for January, 1923, over January, 1922, while for the same months, trucks showed an increase of 111 per cent.

Clarence A. Earl Elected **Head of National Motors**

New Corporation Will Have Offices in Detroit-To Absorb Another Firm There

CHICAGO, March 5-Clarence A. Earl, former president of Earl Motors and for five years associate of John N. Willys at the head of the Willys-Overland Co., has been elected president and general manager of National Motors Corp. This action, which has been in course of negotiation for some time, was effected at the last meeting of the board of directors of National Motors in New York and the official announcement has just been made.

Earl will assume active charge immediately. The general executive headquarters of National Motors will be in Detroit, it is stated.

Another appointment of the highest importance was also announced. Walter M. Anthony, treasurer and comptroller of the Maxwell Motor Co. for eight years and for ten years treasurer of the Commonwealth Edison Co., was made vice-president and treasurer of National Motors.

The executive operating personnel of National Motors Corp. now is as follows:

President and General Manager, Clarence A. Earl. Vice-president in charge of production.

A. Gloetzner.
Vice-president in charge of Kentucky

division, Robert V. Board.
Vice-president in charge of St. Louis division, T. C. Brandle.

Vice-president in charge of Indianapolis division, George M. Dickson.

Vice-president in charge of Saginaw

vice-president in charge of Saginaw livision, C. V. Hale. Vice-president in charge of Jackson livision, Walter J. Mery. Vice-president and treasurer, Walter M. charge of Jackson

Chief engineer, C. L. Halladay.

Installation of the additional executive officers of National Motors Corp. is part of the general manufacturing and operating program which the corporation has been working hard to develop during the past year. There is no change in the executive policy of the corporation, it is stated, but Earl and Anthony have

been chosen to take active charge of their departments to urge the work of manufacturing at top speed.

Assumption of office by Earl is an important step in the manufacturing program. The scheduled production of National cars and Traffic trucks, 55,500, puts National Motors in the first group of big producers. The full line of National automobiles in three classes has been exhibited in the motor shows throughout the country and the product, it is stated, has been practically absorbed already by distributors and dealers. The National 6-31, a small six at \$795, was one of the feature cars of the shows and attracted attention of dealers from all sections.

Earl resigned last November from Earl Motors. For a period of five years he was one of the most important executive factors in the Willys-Overland Co.

New Head of National Upward Trend in Production Motors Corp.



CLARENCE A. EARL

"No automobile man could have a greater opportunity," said Earl, "than in this tremendous new organization which has all the prestige of a fine old name and unlimited manufacturing facilities and the enterprise and energy of a new organization full of enthusiasm. We have the factories, we have the men and we have the financial ability to put over a great manufacturing program and the work is under way with prospects for a splendid year of success.

"In taking over this work at this time. everything has been placed in my hands in ideal condition to go forward with efficiency and with the thorough cooperation of all my associates. I believe that our factories are ideally located to do their parts in our vast manufacturing program and I know that they are all in first class condition.

Headquarters of National Motors will continue temporarily in Chicago until the acquisition of one of the large plants in Detroit which is going to join forces with the new organization can be legally consummated.

National Motors Corp. was announced last summer as the merger of eight automotive manufacturing plants situated in seven different states. The corporation was called Associated Motor Industries for the purposes of organization, but the name was announced as National Motors Corp. just before the New York show, when the new National cars made their first appearance.

N. A. C. C. LAWYER DIES

NEW YORK, Mar. 3-Charles Thaddeus Terry, general law counsel of the National Automobile Chamber of Commerce, died this week of angina pectoris. His death comes as a blow to the automobile industry in which he long has been a leading legal light. Terry's connection with automobile legislation and litigation, covering two decades, began in the days when the National Association of Automobile Manufacturers was in its infancy.

As Spring Buying Starts

Truck Builders Report Output Is 50 Per Cent Greater Than One Year Ago

NEW YORK, March 5-With the big buying season yet to come, production in the major automobile producing plants is moving along on schedules that are 10 to 20 per cent higher than those followed in the first two months of the year. At this rate, March will turn out cars greatly in excess of the number a year ago, when, after an extended lull, factory operations began to take an upward swing that carried through a series of record-breaking months and culminated in a year that established a high mark in the production history of the industry.

A larger proportion of plant activities are now concerning themselves with open car production, increased popularity of this type accompanying the approach of the spring season. Such stocks of open car models as the dealers may have had on hand are moving rapidly and, due to the fact that open roads and seasonable weather will permit the greater use of driveaways as a means of delivery, there will be little trouble in replenishing these stocks except in cases where demand outstrips the rate of production.

As compared with a year ago, truck builders report a 50 per cent increase in production and the outlook for greater business particularly bright. The conditions that existed in the truck market a year ago are absent this year and there is apparent a more encouraging attitude among prospective purchasers. During the last 30 days there has been a pronounced forward movement in this branch of the industry, with the consequent advancement of manufacturing schedules

Reeves Predicts Production of 3.000.000 Vehicles in 1923

NEW YORK, March 6-Alfred Reeves, general manager of the National Automobile Chamber of Commerce, spoke at the twentieth anniversary gathering of the West Side Y. M. C. A. automobile school on the "Outlook for the Automobile Industry."

Reeves predicted a production of 3,000,-000 motor cars and trucks in 1923, basing his estimate on January and February production and depending on the supplies of enclosed bodies and plate glass. Discussing the transportation needs of 105,000,000 people, Reeves declared that students of the industry believe the United States can profitably use 12,000,-000 cars and 3,000,000 trucks, which would require a renewal demand in excess of 2,400,000 vehicles.

Speaking as an oracle for 1923, Reeves declared that standard motor cars and trucks will be in the greatest demand.

General Motors Production Totals 456,763 for 1922

Company's Report Shows Business Done by Various Units More Than Double That of 1921

NEW YORK, March 6—Official announcement is made by the General Motors Corp. that the production of pas-

senger cars and trucks by its various units for 1922 totaled 456,763 in comparison with 214,799 the previous year. This is approximately 18 per cent of the country's total production of 2,577,763 motor vehicles.

The sales by quarters in 1922 were: First quarter, 71,039; second quarter, 135,751; third quarter, 112,055; fourth quarter, 137,918. The sales for the year ended Dec. 31, 1922, compared with the sales of the three preceding calendar years, follow:

PASSENGER CAR	S		
1922	1921	1920	1919
Bulek138,501	83,888	116,213	119,853
Cadillac 22,021	11,130	19,790	19,851
Chevrolet240,390	75,667	144,502	132,710
Oakland 20,853	12,661	37,244	54,451
Oldsmobile 21,216	20,245	26,241	33,345
COMMERCIAL CAI	RS		
1922	1921	1920	1919
Chevrolet 2,932	1,480	4,938	2,682
GMC trucks 5,277	2,760	5,137	7,730
Oldsmobile 1,218	466	8,383	7,782
TOTALS			
1922	1921	1920	1919
Passenger cars442,981	203,591	343,990	360,210
Commercial cars 9,427	4,715	18,458	18,194
*Miscellaneous 4,355	6,493	30,627	13,334
Grand total456,763	214,799	393,075	391,738

^{*} Includes tractors and also cars and trucks not now manufactured.

Van Cleef New President of Automotive Mnfrs' Assn.

CHICAGO, March 3-An enlarged program of merchandising co-operation is planned by the Automotive Manufacturers' Association, following the election of new officers and directors. The election resulted as follows: President, Noah Van Cleef, Van Cleef Bros., Chicago; vice-president, Franklin Mayo, Mayo-Skinner Mfg. Co., Chicago; treasurer, James T. Greenlee, Imperial Brass Mfg. Co., Chicago; directors, Frank Parizek, D. Pettingell, Chicago; Chicago: C. James Nealyon, Chicago; G. F. Disher, Milwaukee; C. H. Hathaway, Milwaukee; H. S. Pardee, Chicago; W. G. Pancoast, Waukegan, Ill.; C. J. Buckwalter, Chicago; B. H. Lancaster, Chicago; H. E. Patterson, Chicago; L. W. Golder, Chicago; A. C. Johnson, Chicago.

Exchange of information regarding domestic and foreign sales opportunities is one of the activities of the association and the plans of President Van Cleef contemplate extension of activities that will aid in developing the sales of the member concerns.

Continued progress of the association is noted under the management of Secretary W. E. Green who is in charge of the office, following the resignation recently of George Fritz as manager. The office has been moved to 1005 Consumers Building, Chicago.

SHOW AT SPRINGFIELD, MASS.

SPRINGFIELD, Mass., March 6—The eighth annual show of the Springfield Automotive Dealers' Association in the Municipal Auditorium Feb. 27 to March 3 outclassed any of the previous shows here in the beauty and variety of models on display. Attendance was heavy and

the interest evinced and sales and prospects forthcoming confirmed the belief of the dealers that the coming spring and summer will constitute the most prosperous season in automobile history in this district. The exhibition ran very largely to enclosed cars, with interest directed especially to the new coach designs and the smart sport models. Magnificent cars of the limousine type were more admired than ever before.

12,000 ATTEND THIS SHOW

SPRINGFIELD, O., March 1—About 12,000 persons attended the Springfield automobile show in Memorial hall the past week, according to an estimate made by W. F. Townsley, treasurer of the Springfield Auto Trades Association. He estimates that more than 75 cars were sold during the show. A large list of prospects will be followed up by the dealers. All say they are enthusiastic over the results which are in prospect.

Sixteen dealers entered 21 different makes of cars, which included more than 100 models in the Springfield show. The first half of the week open cars were shown and the last half only enclosed cars were displayed. Fred W. Moyer was chairman of the committee in charge of the show.

BIRMINGHAM, Ala., March 2—The S. B. Quigley Motor Co., of Mobile, Ala., was awarded a silver cup by the Studebaker company for the largest number of sales of Studebakers of any city in the 50,000 to 100,000 class.

The awarding of cups was started the first of the year and Mobile was the first city to win in their class. They delivered 18 Studebakers during the month of January.

New Orleans Garage Men in Campaign Against Thefts

Service Association Distributes to All Members Bulletins of Stolen Cars

NEW ORLEANS, March 3—Automobile thieves who have been operating in and around this city face a more difficult problem of disposing of stolen automobiles as a result of an arrangement worked out by the New Orleans Superintendent of Police and the Automotive Service Association. The latter organization is a recent formation of garage, service station and battery men.

Hitherto, automobile thieves have had a comparatively easy time selling stolen cars either direct to garage men or placing cars in garages for resale. This market now is closed permanently so far as New Orleans is concerned, and indications are that few stolen cars, if any at all, will be sold through service stations in this city and surrounding country.

A bulletin system has been inaugurated by the police department, and every stolen automobile will be reported to garage and service stations. A complete record of cars thus will be kept, as the bulletin will be issued daily from reports received at police headquarters. The list gives the make of the car and the model, motor number and other marks of identification. The bulletins are sent to headquarters of the association, and are distributed from that center to every leading garage in New Orleans.

In addition to this service, a monthly bulletin showing the number of every stolen car will be published by "Service Station," official organ of the association. This bulletin will indicate what cars have been recovered and those that still are missing.

The association already has gone a step further in the fight to rid the country of automobile thieves. Many cars stolen have been brought from Texas to New Orleans for disposition, and the association will combat this practice also. Automobiles listed by the stolen car bureau of Dallas, Tex., will be bulletined to New Orleans garages. The Dallas bureau, it is said, has a record of every automobile stolen in Texas. Reports will give service station and garage men information on stolen cars throughout Louisiana and Mississippi as well.

TO MAKE TRAILERS

MEMPHIS, Tenn., March 2—A new concern has been organized and incorporated with a capital stock of \$1,000,000 to make trailer trucks here. The sevenacre site and plant of the Southern Motor Co. has been purchased for a site. Joseph Newberger, prominent cotton man of Memphis, and others are identified with the enterprise. It is contemplated to produce about 3,000 trailers annually.

Many Sales to Farmers as Annual Omaha Show Opens

Better Conditions in Agricultural Sections Adds Interest to Exhibit in Nebraska City

OMAHA, March 3—Omaha's eighteenth annual automotive advertising salon opened here Monday afternoon with an exhibit of 130 passenger cars and thirty trucks.

The first booth on the inside of the entrance belongs to the safety department of the local Chamber of Commerce, and before viewing any cars the visitor is greeted with an exhibition of photographs of at least 30 automobile accidents that have occurred in Omaha, with information as to how they might have been avoided.

A huge canopy, in which green, orange, black and white predominate, houses the salon and furnishes an attractive background for the passenger cars on the main floor.

The survey of the market for 1923 automobiles brings a confident feeling to the dealers that business should carry a pleasing balance at the end of the year. Improved conditions in the agricultural district have been the cause of many sales to farmers in this district. The dealers are optimistic about the business for the coming ten months of the year, They look for a record breaker. low prices for good cars now prevailing is one cause for hastening many a purchase. The dealers have convinced the public in their advertising that right now is the time to buy. Raw material is constantly going up. Every dealer in this section says that business recovery is well under way in this territory.

A. B. Waugh, show maanger and commissioner of the Omaha Auto Trade Association, predicted that this show would open the way for a big volume of sales in this territory.

Sales Activity Marked at Davenport's Automobile Show

DAVENPORT, Ia., March 2—Davenport automobile dealers are going after the business this spring, it became apparent Tuesday night as one glanced down the long aisles of the Coliseum where the second annual Davenport Automobile Dealers' Exhibitors' Association show opened. Personal canvass, demonstration of their cars with confidence in the financial outlook of the middle west buyer-field, backed up by a large publicity campaign in local newspapers, is the program.

Weather conditions in the last week have not been favorable to the automobile salesman, for there is no suggestion of the spring and summer motor trips in this section of the state, but despite this the attendance at the opening night of the show and the evidence of a strong buying public have sustained dealers who two months ago predicted that 1923 would see return of "normal" conditions

Child Helps Sell Car to His Papa

BOSTON, March 2-"What can I do for you, laddie?"

That question was asked a small boy by a salesman at Alvan T. Fuller's salesrooms in Boston on Washington's Birthday.

"My daddy has a lot of pennies to buy an automobile; I gave him some of mine," the child answered. "Where is he?" the salesman asked.

"Where is he?" the salesman asked. And the lad took him by the hand and led him to a man and woman looking over a car.

"Daddy, here's the man that will sell you the car," the child said. And everyone smiled. And in a few minutes a car was sold to the lad's papa, a clean sale without a trade. They had been in the store some time, and were on the point of going out when the youngster intervened, aided by the friendliness of the salesman.

"Wish I had you as an assistant all day," was the salesman's parting com-

in the local trade. Agencies report that sales are unusually high for the close of February. Cars in the \$1200-\$1500 class are favorites and the enclosed model demand promises to swamp all previous records in this class.

Moon Profits In 1922 Many Times Those of Year Before

ST. LOUIS, March 1—Net earnings of \$913,883 against \$120,051 in 1921 are shown in the annual report of the Moon Motor Car Co. After allowing for taxes and payment of preferred dividends, net income was \$773,341, equal to \$5.01 a share on the 154,213 shares of no par value common stock outstanding. Net income was \$77,575 or 50 cents a share on the stock outstanding at the end of 1921. Gross sales of passenger cars, accessories and parts in 1922 were \$5,877,-159 against \$3,505,880 in 1921. Operating and administrative expenses were \$6,-159,635.

Net current assets of \$1,805,616 against net current liabilities of \$563,762 are shown on the balance sheet as of Dec. 31, at which time inventories were \$794,610 against \$435,024 at the close of 1921.

The company's schedule calls for the production of 15,000 cars this year as against 7000 in 1922.

WHITE SALES \$37,000,000

CLEVELAND, March 3—The White Motor Co. sales for 1922 aggregated \$37,-000,000 gross, while the net earnings after all charges except dividends, were \$3,700,000, according to a statement made by the company.

The uninterrupted dividend policy of the company was continued throughout the year, and after disbursements of \$2,000,000, or 8 per cent, were made for this purpose, a balance of about \$1,700,000 remains for 1922 to be carried to the surplus account.

Dealer Wins Prize With 1898 Car At Salt Lake City Show

Annual Intermountain Exhibition Largely Attended and Many Sales Made

SALT LAKE CITY, March 2—The Intermountain Automotive Trades' Assn. brought its annual exhibition at the Bonneville Park to a close after a week's run. It was generally conceded to have been the most elaborate and beautiful display of automobiles and automobile accessories ever held in Utah and one of the best attended shows the association has held. Visitors came from almost every section of the mountain country and the great exhibit pavilion was thronged each day. An admission fee of 50 cents was charged.

The attitude of visitors from a sales standpoint was all that could be desired and was unquestionably better this year than for a long time. Many good deals were made by live representatives of the various firms who had cars on exhibition and numerous prospects were secured. No one branch of the business ecured. No one branch of the business—if we may divide it into big cars, little cars and accessories—seemed to have come out best.

An interesting feature of the show was the giving of a prize to the owner of the oldest car driven to the pavilion during the exhibition. This prize was won by a Salt Lake City dealer. The car was originally owned by a man named Silver and was shipped to this city in April, 1898. It was the sixteenth annual show held in this territory and one of the most important departures this year was the decorative scheme, the pavilion being dressed to give it a spring-like effect.

Dealer Putting Bodies On Truck Chassis Is Taxed

WASHINGTON, March 3—In Treasury Decision number 3443 issued by the Commissioner of Internal Revenue, notice is given that "a retail dealer in automobile trucks who purchased truck chassis from one maker and bodies from another, assembled the same, and sold the completed truck, is a manufacturer or producer within the meaning of Section 900 of the Revenue Act of 1918."

The decision holds that the party as a manufacturer or producer is liable to a tax of 3 per cent on the gross sales price of the completed truck, credit being given for the sales tax paid by him to the manufacturers of the chassis and bodies."

The Commissioner points out that the decision is based upon the action of the United States Circuit Court of Appeals, Ninth District, affirming the judgment of the United States District Court for the Southern District of California, Southern Division, in the case of R. C. Klepper, doing business under the fictitious name of Bethlehem Motors Company, v. John P. Carter, Collector.

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Used Car Price Report to Be Published Monthly by New York Dealers' Association

Actual Sales of Used Cars of Makes Other Than Those Sold New by the Dealers to Be Used as Basis of the Compilation

NEW YORK, March 6-The interchange of current used car price information is proposed in the report of the Special Used Car Committee of the Automobile Merchants' Association of this city. Up to the present time over 50 per cent of the membership, representing about half of the new car distribution in the city, has agreed to co-operate in the project. It is also stated that in cases where dealers have not signed the agreement, it is because responsible executives are out of the city. It is the aim of the association to secure the co-operation of dealers having 75 per cent of the distribution of new cars in the metropolitan area.

The plan provides for the appointment by the president of the association of a permanent used car committee consisting of 10 representative dealers in the various price classes. This committee will meet weekly and will also call a monthly meeting of all members for the purpose of discussing used car operations. It will also provide the blanks required in the operation of the plan and will supervise the operation of the Used Car Bureau which will be organized as a part of the association. This bureau will compile and distribute used car price information.

To start off with, dealers entering into the plan will make a report of all used cars sold during the past six months, by months, on forms to be supplied by the bureau. Two different forms will be used for this purpose-one to report the sales of cars of the make that the dealer is now handling and the other to report sales of other makes of cars. This report will give the make and model of the car and the net price, that is the actual selling price less the cost of reconditioning. After the initial report, similar reports will be made to the Bureau semi-monthly. These reports will be used to compile loose-leaf booklets of price information. The sheets in this booklet, which will be issued twice a month, will give the prices which the reports of the members show that the public has actually paid for various makes and models of cars.

The price of this booklet service will be \$15 a year for each subscriber and each dealer is expected to sign for as many booklets as he has new and used car salesmen because it is intended that each salesman will carry this price data. The revenue from this source is expected to cover the cost of operation.

The appraisal forms used will have three colors. One will be used by the dealer reporting sales to the public of cars other than of the make he regularly handles. The basic price information in the loose-leaf booklet will be compiled

Chicago Dealers Give Up Weekly Used Car Bulletin

CHICAGO, March 6—The weekly used car bulletin issued by the Chicago Automobile Trade Association since early in 1922 for the purpose of showing the prevailing prices of used cars in Chicago through the listing by dealers of used cars on hand and the prices asked for them, has been discontinued by vote of the board of directors. Announcing the discontinuance, the official publication of the association states:

"An analysis of the material sent in showed that many firms were holding up the asking prices of their cars all the way from \$100 to \$300 in excess of what they were actually taking for them. Therefore, the asking prices shown in our bulletin and the resale prices were inflated. An over-allowance was made on many a used car, hence the sales prices were in excess of their actual value.

"It was also shown that figures shown in the bulletin were being used to the detriment of the members by their salesmen. Many salesmen, not content with the appraisals made by their companies, argued that the figures in the bulletin, which were often higher, were correct. This caused a great deal of friction between salesmen who were anxions to make a long allowance and their used car departments."

from these reports. Another form will be used to report the selling prices of used cars of the make handled by the dealer reporting. The third form is for reports of sales to used car dealers. The reports on the last two forms will not be used in computing the prices published in the loose-leaf booklet.

Numerous advantages are claimed for the plan. Every salesman will have in his pocket the prices which the public has paid for various makes and models of cars. The salesmen will be able to show prospects the market value of their used cars. Furthermore, the prospect will know that a dealer who offers him more than the market value is in fact cutting the price on the new car.

The report of the committee is introduced by a rather frank discussion of the used car problem. It is stated here that the committee does not believe in charging the new car department with used car losses, and that the used car department should at least break even. If there are losses on used cars, the fact should stand out in red rather than being covered up by the black of new car profits.

Earl Motors Manufacturing Co. Is Reorganized in Jackson

\$1,000,000 Is Given as the Fully Paid-in Capital of New Company

CHICAGO, March 1—Announcement is made here of the incorporation in Michigan of the Earl Motors Manufacturing Co., a new corporation which will lease and operate the plant of Earl Motors, Inc., at Jackson, Mich., and manage the sale and distribution of Earl ears.

The new corporation is capitalized for \$1,000,000 fully paid in, according to George C. Scobie, president, who was conferring here today with bankers who are underwriting the new financing plan. All the stock of the new company is owned by the old company under an arrangement which relieves the new company of all bank debts and obligations except current indebtedness for materials and supplies.

The bank debts of Earl Motors will be funded over a period of four years, according to an arrangement approved by the bankers creditors committee of which the chairman is Ralph Van Vechten, vice-president of the Continental and Commercial banks of Chicago. A detailed financial statement of this plan is not ready for publication, Scobie said.

The purpose of this arrangement is to give the new operating company a free hand to develop and market the Earl product in which the financial interests behind Earl Motors have great confidence. The operating company will be relieved of all financial embarrassment and will have a clear record for credit and contracting business.

Scobie said that practically all of the Earl dealers have remained with the company through the reorganization process, although for some time production at the Earl factory has been practically at a standstill. The factory already is being operated by the new corporation, Scobie said, and efforts will be directed toward speedily bringing it to capacity production of sixty cars a day. At the same time steps will be taken to enlarge the dealer organization.

OLD SOCIAL MOTOR CLUB PASSES

MILWAUKEE, March 3-The Milwaukee Automobile Club, founded Aug. 17. 1905, and one of the oldest local societies of owners in the United States, has been dissolved as a Wisconsin corporation, after being inactive for about five years. For many years it maintained a handsome clubhouse, but with the growth of the number of owners, it was found that an organization having ownership of a car as the principal eligibility requirements no longer attracted the more desirable elements. The club promoted the first Milwaukee show, held in 1908, and conducted 24-hour races in 1906 and 1907 which still form interesting history.

"Best Ever," Say Dealers of This Year's Frisco Show

More Cars, More Accessories, Greater Attendance, Lively Sales Mark Coast Event

SAN FRANCISCO, Cal., March 1-The San Francisco (Pacific) Automobile Show, which opened in the Exposition Auditorium here on Feb. 17, and closed Feb. 24, presented more types of cars, more individual exhibitors of passenger cars, trucks and tractors, more equipment dealers, and was rewarded with a larger attendance than any exhibition of automobiles ever held on the Pacific Coast before. The Pacific Automobile Show was unique in that it combined a mechanical exhibition, a merchandising show and a dealers' convention, with representatives from virtually every city between the Canadian and the Mexican lines on this shore of the United States.

Like the preceding shows at Los Angeles and Oakland, this was, first of all, a merchandising show. Prices at San Francisco were shown and talked, and every salesman from the 38 firms, which exhibited passenger cars on the main floor, could tell offhand the price of any one of his cars delivered at any point on the Pacific Coast. This, alone, differentiated the show to a marked degree from any previous show held here, and materially assisted in the closing of sales right at the moment, on the floor of the exhibit.

Equipment men entered this show with a spirit never before shown in any show anywhere on this coast, 71 of them from San Francisco alone being numbered among the exhibitors on the second floor, the domain set apart for the majority of the equipment exhibitors. In the commodious basement, the truck and tractor dealers, and some of the equipment men, had their exhibits, and there were 34 of these, making a total of 143 passenger car, truck, tractor and equipment dealers and distributors in the 1923 Pacific Automobile Show.

The exhibition opened the spring selling season with a bang. With the best years since 1919 behind them, and with January, 1923, far exceeling in sales the

Ford in Canada Hints Price Increase Is Near

DETROIT, March 3—Ford Motor Co. of Canada, Ltd., is advertising in Canadian papers that its salesmen have been instructed to call upon every family in the Dominion so that everyone who wishes to buy a car at the present low figures may have an opportunity to do so.

The advertisements declare that the tendency is toward increased prices and urge that all prospective purchasers protect themselves by placing orders for cars at once.

same month of 1922, all the dealers were on their toes, and as close a count as could be obtained showed that 202 sales were made for the passenger car dealers alone, on the floor of the show, an average of rather better than five cars to each of the 38 exhibitors.

Enclosed cars predominated, both in the exhibits and in the attention given these exhibits by the crowds, and the fine, clear weather which persisted throughout the week of the exhibit apparently made no reduction in the interest in the enclosed cars. In this connection the makers of the so-called "California tops" had seven field days in the week and another on the Saturday night of the opening. The vogue of the California top has spread all over the Pacific Coast. The New York and Chicago shows contributed a number of new models, not before shown on this coast.

The dealers had their innings during the week, when 22 conferences of various dealers' and distributors' organizations up and down the coast were held in San Francisco. More than 2.000 out-of-town dealers attended the show, some coming from as far away as northern Washington, and others from towns in Arizona and New Mexico. Many of these came to buy, but a large percentage came just to look, obtaining their stocks later from distributors in their own territory. For example, J. W. Leavitt & Co., which is one of the oldest automobile merchandising firms in America, having been selling transportation for more than 30 years. called in its men from Los Angeles, Sacramento, Fresno, Reno, Stockton, Bakersfield, Pasadena, Riverside, San Diego and other towns, as well as San Francisco, for a convention during the show. This firm distributes Oldsmobiles and Columbias, and its meeting covered three full days. Packard distributors from the whole Pacific slope held a two-day conference, with R. E. Chamberlain, general sales manager of the Packard Motor Car Co., presiding. These distributors came from as far north as Victoria, B. C.; as for south as Tucson, Ariz., and as far east as Reno. A score of other firms called in their men for similar confer-

A number of executives of eastern automobile factories also attended the Pacific Automobile Show, among them William N. Thompson, of the Stutz Motor Car Co. of America; J. F. Morrison, secretary of the Cole Motor Car Co.; John N. Willys, president of the Willys-Overland Co.; F. E. Moskovics, vice-president and general manager of the Nordyke & Marmon Co.; E. V. Rickenbacker, of the Rickenbacker Motor Co., and many others.

Back of Manager Wahlgreen in making this show the largest and most successful of any yet held on the Pacific Coast were Don Lee, E. S. Jones, Hart Weaver, N. J. Benson and W. F. Culberson, all leaders in the organization of dealers in San Francisco and members of the show committee.

Liberty Assets Ordered Sold At Auction April 3

Percy Owen and Edward Verlinden Reported to Head Groups Considering Buying Property

DETROIT, March 3—The plant and property of the Liberty Motor Car Co. will be sold at public auction April 3 by an order issued to the receiver this week in the United States District Court. The order specifies that the minimum acceptable bid is \$1,175,000 and that the successful bidder must deposit a certified check for \$10,000 on acceptance.

The financial statement of the company lists assets at \$1,673,535 and liabilities \$1,601,262, exclusive of stock.

From well informed sources there appears at this time the possibility of two responsible bidders for the property, the one headed by Percy Owen, president of the present Liberty company, and the other by Edward Verlinden, president of the Olds Motor Works during the Durant regime in General Motors and later identified with the Durant Michigan company as president.

If Owen enters the field as a bidder he will be backed by New York capital, the sources of which he has been negotiating with over a period of several months. Verlinden will have the backing of a group of persons in the financial and parts manufacturing field, who, it is declared, will be in a position to give the company all the backing necessary to place it strongly in the field.

No matter which group takes over the property, it is cetrain that the product will undergo a complete change. The Verlinden plan is understood to provide for the manufacture of a light six car which would sell in the \$1,000 price class. This car has been fully developed by Verlinden and investigations of the market have led to the belief that 30,000 could be built and sold in the first year of operation. Owen's plans also call for a new line, but they have not been disclosed.

Anderson Company Has Safety Bureau for Drivers

ROCK HILL, S. C., March 3—Frank Glenn has been placed in charge of the safety bureau created by the Anderson Motor Co., for the purpose of assisting the present overcrowded agencies now devoted to that work. The bureau will mail weekly stories to newspapers and will provide instructions to all Anderson salesmen so they can instruct the new buyer of an Anderson car, not only in the mechanical requirements, but also in safety driving, regulations and observances.

Finance Companies Have a Distinct Economic Position

Federal Reserve Board Compares Them to Cattle Loan Companies in Relation to Banks

WASHINGTON, March 3—An extensive study of finance companies, especially those engaged in the wholesale and retail automobile field, is published in the January issue of the Federal Reserve Bulletin, issued by the Federal Reserve Board. Justification for the existence of these companies is contained in the concluding paragraph where it is stated that "they are enabled to supplement our commercial banking system and to make for themselves a distinct economic position in our financial organization."

The article deals with the two phases of the automotive financing business, (1) Advances made to assist the dealer in securing cars from the manufacturer, and (2) Accommodation enabling the dealer to sell on the installment plan without the necessity of keeping his own capital tied up and so limit his operations.

The writer of the article admits the lack of reliable statistics showing accurately the proportion of sales made on the installment plan, but he states that the estimates of authorities vary from 50 to 70 per cent of the total number of cars sold. It is stated that the charge of automobile finance companies as a general rule approximates 15 per cent on the funds outstanding. The percentage of past due accounts, it is stated, ranges from a fraction of one per cent to 15 to 20 per cent, but that the percentage of the total number of cars financed which it is necessary to repossess is very low, in most cases being not more than 1 per cent.

Discussing the economic position of finance companies, the articles says:

"Their business has tended more and more to resemble the practices of commercial banks. The relation between the two closely resembles that between cattle loan companies and banks.

"There are in the United States a vast number of companies and individuals whose resources, or apparent credit risk, do not measure up to the standard required by banks. It is largely these that the finance company is called upon to finance. It does not necessarily follow that such subjects are not good credit risks, but merely that insofar as the bank is able to investigate, they do not fulfill the usual requirements. In addition, payments of the loans made to this class may be spread over a longer period than that for which a commercial bank will advance funds. The payments too, are probably in small lots, such as installments, which must be carefully watched and rigidly collected when due.

"Collateral offered as security is in small lots, such as a group of small accounts receivable. As a result, commercial banks find this class of business unprofitable at the usual rates of interest. If they charged more it would lead to legal difficulties in some cases, and nearly always to dissension among those borrowers who have to pay the higher rate. Finance companies, however, by dealing only with this class of customers can charge more without causing dissatisfaction among customers. This increased income enables it to carry the investigation further and to protect itself in making a loan, and also to watch developments after the loan is made. In short, finance companies are an intensified part of our commercial banking system."

U. S. Health Officials Combat Carbon Monoxide

BALTIMORE, Md., March 3—Elaborate tests are being made in Baltimore by the local health officials, representatives of the United States Public Health Service and the Bureau of Standards, in an effort to develop a code to be made Federal standard, dealing with the danger from carbon monoxide fumes, which have caused the death of many motorists and automobile repair men. The officials recently made exhaustive tests in this city at a garage where two men were overoome by the gas. It is said that the practicability of the tannic-acid test was conclusively demonstrated. A mouse and guinea pig were used in making the test.

The same automobile which was responsible for the two workmen being overcome was used in the test.

A. S. A. ANNUAL DINNER

NEW YORK, March 3-The Automotive Service Assn. of New York held its annual dinner at the Automobile Club of America Tuesday night. About 150 members attended and after the dinner they listened to addresses from officers in the organization and others identified with the automobile industry. H. R. Cobleigh, service secretary of the N. A. C. C., spoke of the development of service throughout the country and the part the national organization is playing. President Rabidoux acted as toastmaster. speakers were Al Bergmann of the C. G. Bumper Co., A. B. Cummer, service manager of the Autocar Co., Charles Michaels of Michaels & Mourre and J. Howard Pile, technical editor of Motor

SEIBERLING SALES INCREASE

AKRON, O., Mar. 1—The Seiberling Rubber Co., as compared to sales of \$385,000 in December of last year, estimates its February business will exceed \$500,000, while sales for the first week in February showed an increase of 22.75 per cent over the best previous week in the company's history. The two Seiberling plants at New Castle, Pa., and Barberton, Ohio, are now producing at the rate of 1700 casings and 2000 tubes daily.

Snappy Show at Des Moines; Farmers Let Go Purse Strings

Gloom Relegated to Rear as Attendance and Interest Exceed Any Previous Year

DES MOINES, Ia., March 5—Des Moines' fourteenth annual motor car show, held at the Coliseum Feb. 26 to March 3, brought out by long odds the most enthusiastic expression of spirit that the trade has seen in this territory since the bottom dropped out of business in 1920.

From every standpoint the show was the best ever held in the history of the Des Moines Dealers' Association. These are not idle statements, for actual figures from the box office showed good gains for every day during the show, as compared with previous years. Not only was the attendance from the public a record setter, but there was the largest number of dealers present from over the state that the Des Moines show has ever attracted.

And the third factor which made the show a success was the fact that actual sales started Monday and continued throughout the week in numbers far in excess of any other show held here.

A spirit of enthusiasm and "comeback" pervaded show managers, distributors and salesmen. Gloom was relegated to the rear.

Conditions in the Des Moines territory have shown a steady, consistent trend toward the better during the past few months, and the Iowa farmer has returned to the market, not quite to the extent that he was during the boom days, but far more than has been possible during late 1920 and 1921. The farm credit situation has improved materially for six to nine months and the farmer who a year ago would not buy has again appeared on the market.

The Des Moines show this year was a bright, snappy one. The decorations used were a color scheme of blue and white and two panoramic views of the Iowa highways ran the full length of the room on each side of the Coliseum.

On account of the lack of room, no trucks were shown at the Coliseum, the display being confined to cars and accessories. Practically all truck dealers held special displays in their own salesrooms. The spirit of enthusiasm prevalent among the car dealers extended to the truck men and the outlook among them is the best in two years.

DURANT DEALERS' CONVENTION

MEMPHIS, Tenn., March 2—Expecting a great spring selling season in automobiles in the Memphis territory. A. B. Clapp, sales manager, called a general convention of all Durant and Star dealers in the Memphis, section for Tuesday. Feb. 27, in Memphis. About 50 dealers from Arkansas, Mississippi and Tennessee were invited.

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CONCERNING MEN YOU KNOW

Hayes McFarland has been appointed vice-president and director of sales and advertising of the Bassick Manufacturing Co. of Chicago, maker of Alemite lubrication systems. McFar-land's promotion follows two years of success-ful experience as retail sales and distribution man-ager for Alemite products. In his new capacity he will be responsible for greatly enlarging the Alemite sales and advertising operations in keep-ing with the expansion resulting from the merger of his company into the Bassick-Alemite Cor-poration.

M. S. Bottume, former secretary and sales anager of C. Cowles & Co., New Haven, Conn., as become vice-president in charge of sales Joseph N. Smith & Co., Detroit, builders automotive hardware.

Henry F. Russell, formerly with the Lumen Bearing Co. and for the past five years sales manger of the iron foundry department of Farrar & Trefts, Inc., Buffalo, has been appointed treasurer and general manager of the Buffalo Smelting Co., of Buffalo.

J. G. Esser, two years ago with the Burgess-Norton Manufacturing Co., manufacturer of B-N piston pins, and more recently with the Trindl Co. of Chicago, has returned to the Burgess-Norton company, joining its sales force. He will travel the central and western territory.

Norton company, joining its sales force. He will travel the central and western territory.

H. C. Dunning, assistant general manager of the Olds Motor Works of Lansing, Mich., has been named vice-president in charge of production. Dunning is a well-known figure in the industry, being one of the group of executives who first saw service with the old Durant-Dort Carriage Co. at Flint. He has been associated with President A. B. C. Hardy on several undertakings before joining him at the Olds plant.

W. Q. Hall, formerly salesmanager of the Columbia Motor Truck Supply Co., Louisville, Ky., has been appointed district sales representative for Frank C. Hip, Inc., of Chicago, Ill.

Osmond L. Barringer, who has been in the automobile business in Charlotte, N. C., since Dec., 1900, was made an honorary member of the Charlotte Automotive Trades Association for life at the weekly meeting of the association and at the same time was presented with a handsome silver loving cup in testimony of the esteem in which he is held by members of the association. Barringer holds the distinction of having driven the first car from Charlotte to Asheville to travel over that highway, the trip having been made in a Locomobile in 1901.

Chas. W. Tway of Atlanta, Ga, has been appointed Havnes southern sales supervisor. He

Chas. W. Tway of Atlanta, Ga., has been appointed Haynes southern sales supervisor. He will act in the general capacity of district sales manager for the southern states east of the Mississippi river, including Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi and that part of Louisiana lying east of the river and the southern portion of the state of Kentucky. He will close contracts with distributors and dealers for the Haynes factory.

H. K. Hayden, special representative of the utomotive equipment department of the Westaghouse Electric and Manufacturing Co., Springeld, Mass., has sailed for Europe for a two
nonths' survey on trade possibilities and service
eds in connection with the company's foreign
usiness. After leaving London, Hayden will
e accompanied by E. D. Kilburn, vice-president
f the Westinghouse International Co., and other
meering and commercial staff.

George W. Alger, for four and a half years.

George W. Alger, for four and a half years Michigan branch manager of the Oakland Motor Car Co., with headquarters at the plant at Pontiac, has resigned. He will leave Pontiac but has not announced his future plans. Clare E. Borland, former branch manager at Des Moines, Ia., has been appointed in his place by Salesmanager C. J. Nephler.

W. A. Sullivan, formerly with Oakland as sistant advertising manager, who has recently een in the retail field at Jackson, has returned Oakland.

Arthur E. Barker, vice-president of the Maxwell Motor Corp., announces the appointment of the following district salesmen: R. C. Hockett, in the Dallas district under Jos. C. deVarona, district supervisor; B. C. Gertig, assigned to the New York territory under G. L. Redman, district supervisor for New York; P. C. Tevis in the Texas territory; A. P. Clark in the Denver district under E. M. Greene, district supervisor; H. C. Rogers in the Indianapolis territory under W. D. Chambers, district supervisor; R. W. Hartwell in the Kansas City territory. Arthur E. Barker, vice-president of the Max-

Oskar Kylin has been elected vice-president of Foster Machine Co., Elkhart, Ind., manu-

facturer of turret lathes and screw machines. He will continue in charge of sales and engineering. The Syracuse Supply Co., Syracuse, N.Y., has been appointed exclusive agent for the Foster

Products.

R. P. Henderson has been appointed general sales manager of the Martin-Parry Corp. of York, Pa., it is announced by F. M. Small, president. Henderson was one of the organizers of the Cole Motor Co. and later was the builder of the Henderson car. In 1916 he went with the Parry Mfg. Co., with which the Martin Buggy Co. was later merged to form the Martin-Parry Corp.

Corp.

William F. Emerson, secretary of the Auto-Hone Co., Buffalo, N. Y., states that Leon A. Hallstead and Geo. D. Armstrong, president and vice-president, respectively, of the Auto-Hone Co., resigned more than a year ago from a Cincinnati company with which they were connected and since then have devoted all their time to the Auto-Hone Co.

time to the Auto-Hone Co.

R. C. Getsinger, formerly salesmanager of the Lincoln Motor Car Co., and C. L. Fox, assistant salesmanager, both of whom have been identified with the sales department of the Ford Motor Co. in connection with Lincoln Sales during the past year, have resigned and formed the Getsinger-Fox Co., manufacturers' representatives, with offices in the General Motors Building, Detroit. They will represent the Fleetwood Metal Body Co. and the J. B. Judkins Co. in the sale of highelass body work and are also working out sales arrangements with leading body accessory and equipment companies.

E. R. Paige, formerly sales manager for the

E. R. Paige, formerly sales manager for the imons Sales Co., Detroit, distributor of Overund and Willys-Knight motor cars for the ate of Michigan, has been appointed salesanager of Willys-Overland, Ltd., Toronto, Can.

manager of Willys-Overland, Ltd., Toronto, Can. B. G. Koether, recently appointed director of the advertising, sales and service staff of the General Motors Corp. at Detroit, and a member of the Advisory Council of the Federated Engineers Development Corp. of Jersey City, N. J., was one of the speakers at the Council's February monthly meeting, which was in the nature of a farewell for Koether, who is moving from Newark to Detroit to take up his new duties there. Among the other speakers were Dr. Charles P. Steinmetz, vice-president of the organization; Sir Charles Higham of London, Dr. Bradley Stoughton, M. Wilson-Laurenson of the Union Carbide Co., E. St. Elmo Lewis and T. Irving Potter. Irving Potter.

T. Irving Potter.
Thomas Midgley, Jr., of the General Motors Research Corp., has been awarded the 1922 Nichols gold medal presented by the American Chemical Society to the author of the most exceptionally meritorious paper published during the year in the society's journals. Midgley, who is at the head of the fuel section at the Research Corporation's Laboratories at Dayton, O., gained this honor through his contributions in developing an anti-knock compound to be used in the ing an anti-knock compound to be used in the fuel of internal combustion engines. The medal will be presented at a dinner to be held in New York March 9, at which time Midgley will review the effects of anti-knock compounds on gaseous detonation and illustrate his remarks with slides. His talk will be accompanied by experiments.

E. A. Travis, who has been general salesmanager of the Locomobile Co. of America, a Durant enterprise, has been called into the executive offices of Durant Motors, Inc., in New York City, where he will be an assistant to the president, W. C. Durant, in connection with his Locomobile duties. mobile duties.

W. N. Thompson, president of the Stutz Motor Car Co. of America, Inc., has gong to California to watch the Stutz developments on the Pacific Coast, following the introduction of the new six.

Coast, following the introduction of the new six. Charles H. Moon, who has been manager for the White Company's branch at 911 West Jefferson street, Louisville, Ky., for the past year, has just received a promotion and has been appointed manger of the Baltimore district, which includes Baltimore, District of Columbia, all of Virginia and part of West Virginia.

Ward Lederer, president of the Springfield (Mass.) Durant Co., has been on a motor trip down the Pacific Coast as far as Los Angeles.

On a recent visit to Atlanta, C. W. Nash, president of Nash Motors Co., was invited by the Atlanta Journal to give an address for broadcasting by the newspaper's radio station. The automobile manufacturer complied and talked about the magnitude of the automotive industry, reciting for the benefit of his listeners many important facts about the industry.

Yellow Cab Makes Change in Size of Wheels and Tires

Claims That Smaller Wheel and Larger Tire Give Cheaper Mileage

CHICAGO, March 2-The Yellow Cab Manufacturing Co. announces the adoption of the large oversize tire and the small diameter wheel as stock equipment of Yellow cabs. The size selected is a 20-in. rim, either Disteel or Budd type of wheel, with either a 29x41/2 Firestone or Goodyear tire, or a 30x5-in. tire. Both Firestone and Goodyear are manufacturing these sizes.

This revolutionary change in equipment is made only after thorough tryouts on the 1600 cabs the company operates in Chicago. The company claims that these tests have proven so satisfactory that the adoption of the new sizes means that the Yellow cabs can be operated at less cost per mile than the average citizen can operate a touring car. Decreasing the wheel size and increasing the cross section diameter of the tire decreases unsprung weight, it is claimed, and makes for improved riding qualities. Gasoline consumption on cabs using the oversize tires has been decreased and from three to five miles per gallon more mileage have been secured not only in tests with Yellow cabs but also with passenger cars, it is asserted.

"With the new type," says the company in announcing the change, "there is less wear and tear on the tires, while the danger of skidding, even without chains, is practically nullified. An additional advantage is the ease with which sand and mud can be negotiated. In the tire size as created the air pressure is less and the life is longer."

The company finds that on a 20-inch rim the following tire sizes will fit: 29x41/2, 30x5, 32x6 and 34x7.

At the same time the company announces a new model, the 2-A Yellow cab, which will sell at \$1950, is \$300 less than the older model. It is 800 pounds lighter and changes have been made in the springing and braking. In merchandising this new model, the purchaser pays \$300 down and has two years in which to complete his payments.

It is said that the company has decided to cut out all agents from now on and sell direct, doing its own financing.

A. R. KROH TO TALK

PEORIA, Ill., March 2-The principal speaker at the annual convention of the Illinois Automotive Trade Association at Quincy on March 19 will be A. R. Kroh of the Goodyear Tire & Rubber Co., it was announced here by F. C. Zillman, manager of the association.

The program will include a general discussion of activities of the state association, aside from legislative service, and of methods of coordinating the activities of local associations with the state body.

IN THE RETAIL FIELD

E. W. Moseley, St. Cloud, Minn., is a new Dedge Bros. representative. He has been four years with the Harvey E. Mack Co., Minneapolis, northwest distributor. He has a direct factory contract and will erect a building.

northwest distributor. He has a direct factory contract and will erect a building.

The Northwestern Oldsmobile Co., Minneapolis, has adopted a plan that is growing of having district sales agencies in the city, reports Manager A. L. A. Spitler. The new associated dealers are L. A. Anderson Motor Co., 5009 Xerxes avenue S., in the extreme southwestern part of the city; Hesee Motor Service Co., 3412 Nicollet avenue, south central part; New Boston Motor Service Co., 942 20th avenue, N., extreme northwestern section; George r. Detrich, 1226 Washington avenue, N., mid-north district.

The Twin City Motor Car Co. has begun erection of its new central station at Fifth and Exchange streets, St. Paul, to cost \$80,000. It replaces a large church and therefore has a large ground floor space. A three-story garage is to built at East Seventh street and Flandrau avenue, St. Paul; 82 ft. on Seventh street, and is the first improvement of the sort in the industrial suburb of Hazel Park.

renue, St. Paul; 82 ft. on the first improvement of the ial suburb of Hazel Park.

T. M. and W. J. Corcoran have taken over the agency for the Garford truck in Springfield, O. They have established salesrooms and a service station at 239 East Main street.

The Franklin-Louisville Co., Louisville distributor of the Franklin car, formerly located at 634 So. 3rd street, has moved to the large two-story garage building at 104 and 106 East Broad-

Chas. S. Clark of Richmond, Va., has just formed Clark Motors, Inc., with a capital of \$50,000 and has purchased the Chevrolet branch and agency in Virginia from the Chevrolet Motor Co., according to an announcement which has just been made.

The Buffalo (New York) Dort Corp. has been formed, with capital stock at \$50,000. It will take over the business of the Dort Distributing Co., 1237 Main street, Buffalo.

The Chisca Garage, Memphis, Tenn., on S. Main near Pontotoc, which was badly damaged by fire entailing a loss of \$250,000, will be restored. The fleets of several wholesale firms were destroyed in the fire.

were destroyed in the fire.

The Lyric Garage, Memphis, Tenn., has opened this month a new place on Madison avenue, east of Fourth street, at Nos. 265-267.

The Southland Motor Co. is a new wholesale and retail automobile concern in Dallas. The new company, headed by W. T. Youngblood, has just been organized and will retail the Anderson and H. C. S. cars in Dallas and distribute them in the Dallas territory. The Anderson car is a newcomer in this territory.

The Ashley Motor Car Co. has been formed

The Ashley Motor Car Co. has been formed to take over the Ashley Automobile business, handling Franklin cars. Joseph G. Mathey is the new member and the other incorporators are Enos Ashley and E. G. Ashley. The offices are at 1301 Nicollet awenue, Minneapolis.

Forman-Hutcheson Corp., 78 Main street.

Forman-Hutcheson Corp., 78 Main street, empstead, N. Y., has been appointed Maxwell-ealer by Maxwell-Chalmers Sales Co., Brook-n, N. Y.

C. H. Scott, Jr., Brookville, Pa., has taken on the Maxwell line.

Grim & Schupbach have taken a Maxwell dealership in Elgin, Ia.

The Graulich Auto Sales Co. of 406 So. 5th street, Evansville, Ind., has been appointed Maxwell-chalmers dealers.

Pat Gatton & Son of 116 Park avenue, West, has been granted the Chalmers franchise for Mansfield, O.

J. A. Seidel of 24 West Tuonig street, recently ook in the Maxwell line in San Angelo, Texas. The Deal Auto Co., Inc., of Bridgeton, N. J., as been appointed Maxwell-Chalmers dealer.

The Mitchell Hall Motor Co. of 420 National had, has taken the Maxwell franchise at Elm rove under the Capitol Car Co., Wheeling,

Schneiderwind & Zehms, 1401 Indiana avenue, Schneiderwing & Zeams, 1491 and and average Scheboygan, Wis., will remodel their present garage building to give more display and office room, and build a 2-story addition, 40x50 ft., for service and storage.

Charles Henneman & Sons, 28 West Willow street, Chippewa Falls, Wis., Paterson dealers, have been granted the Dort franchise for Chip-pewa Falls and vicinity.

R. E. Newby, Buick dealer at Stevens Point, Wis., will build a 2-story fireproof garage and service station, 70x124 ft., at 201 Clark street, at an estimated cost of \$28,000.

The Zeisler Motors Co., LaCrosse, Wis., is a ew organization formed by Leonard Zeisler and ssociates to represent the Durant and Star line s distributor in western Wisconsin and eastern linnesota, and local dealer in LaCrosse county.

W. Howe, formerly of Madison, Wis., has een engaged as general manager.

M. H. Sinnen, proprietor of the Random Lake Wis.) Garage, has sold the property and busiess to Alfred N. Depies. Sinnen has purchased the business of F. Wilk & Sons, Random Lake, ealers in tractors, implements and hardware.

R. L. Clark, president Badger State Motor Cycle Co., 2218 Meinecke avenue, Milwaukee, will start work March 10 on the erection of a 2-story garage, salesroom and service building, 110x140 ft., on Twentieth street, between Fond du Lac and North avenues, to cost about \$50,000.

The Wausau Durant Motor Car Co., Wausau, Wis., plans to erect a headquarters building for its distributing and retailing business at a cost of \$50,000. Max L. Tisch is manager.

The Crawford Motor Car Co. of New Castle, a., with a capital of \$15,000, has been incororated

The Watson Stabilator Co. of Pittsburgh, Pa., has been incorporated with a capital of \$40,000 to deal in motor vehicles.

The Pillow-Shafer Motor Co. of Butler, Pa., is been incorporated as automobile dealers.

The Uniontown Auto Co. of Uniontown, Pa., has been incorporated with a capital of \$75,000 to deal in motor vehicles.

A new company has been organized in Union-wn, Pa., to take over the agency for the ruesehberg Eight. The new company is com-osed of W. J. Walker, Isaac Jackson and J. N. posed of Hall.

The Springfield (Mass.) Durant Co. has occu-ied an additional building, to be used as a elivery station for its new cars.

delivery station for its new cars.

L. K. Edwards, Escanaba, Mich., has been appointed district distributor of the Oakland in an extensive territory in Upper Michigan, by the Wisconsin Oakland Co., Milwaukee, distributor in Wisconsin and the Peninsula.

The Modern Auto Parts Co., 2303 South Eighth street, Sheboygan, Wis., has completed a shop addition and installed more equipment for general repair and replacement service on gas engines. The concern specializes in regrinding cylinders and fitting new pistons, rings and pins.

Willys-Overland. Inc., 469 Peachtree, street

cylinders and fitting new pistons, rings and pins. Willys-Overland, Inc., 469 Peachtree street, Atlanta, announce the appointment of two new retail dealers in Atlanta. Jesse B. Simmons, who started in the automobile business as a mechanic in Atlanta 18 years ago, has opened a new agency at Hapeville, Ga., an Atlanta suburb. N. H. Adams, formerly with the Ford Motor Co., has organized the Adams-Overland Co., and is constructing a service station and sales room at 201 Lee street, Atlanta.

A new service station and display building is being constructed at Tifton, Ga., by the McCaskill Auto & Tractor Co., the building to be two stories and cost approximately \$15,000 when finished.

The White-Browne Motor Co. has been organized and incorporated at Black Mountain, N. C., with \$25,000 capital, and will establish an automobile agency in that city. E. E. White and T. A. and C. W. Browne, of Black Mountain, organized the new company.

The Lewis Motor Co, has been organized and incorporated to establish a new automobile agency at Fayetteville, N. C., with a capital stock of \$25,000. The incorporators are E. M. Lewis and associates, of Fayetteville.

The Lifsey-Chambers Co., 236 Peachtree street, is the name of a new agency established in Atlanta recently, taking over distribution in the Atlanta territory of the Gardner car, formerly handled by the Brigman Motor Co. All of Georgia and East Tennessee is the territory included in the franchise.

The Craven Motor Co. is the name of a new agency formed recently at New Bern, N. C., by D. D. Daniels of New Bern, and J. B. Attmore and J. Hadder, both of Stonewall, N. C.

E. S. Smalley and Alex McMillan, Jr., of Knoxville, Tenn., have organized and incorporated in that city the Smalley-Chevrolet Co., with \$50,000 capital, and established a Chevrolet agency and service station on Broadway, Knoxville's Auto Row.

An investment of approximately \$500,000 is planned by the Reo Motor Car Co. in the construction at Charlotte, N. C., this spring of a storage and shipping building, to occupy a site 577 by 365 ft. The capacity will be about 3000

With B. H. Hill of Tampa, Fla., as president, and R. C. Eldredge as secretary and treasurer, the Hillsboro Motor Co. has been formed with \$15,000 capital, to establish an agency at Tampa.

A new garage, service station and sales building is being constructed on North Third street, Wilmington, N. C., by MacMillan and Cameron, automotive dealers of that city. The building is to cost about \$30,000.

The Robertson-McKee Motor Co. has be recently organized and incorporated at Orland Fland, with a capital stock of \$100,000, for a stablishment at Orlando of an automobile automobile

Carl H. Bunch, Inc., of 113 West Heron street was granted the Maxwell-Chalmers fran-chise for Aberdeen, Wash., under the American Automobile Co., Inc., Tacoma.

The Continental Service Co., 1011 W. North renue, and Painter and Byrd of 417 So. High-nd avenue, Baltimore, have been appointed axwell dealers by the Fidelity Motors Co. of

The Busy Bee Garage has reeently been granted the Maxwell franchise for Nashville, Ill., under Vard Motor Co., St. Louis.

The E. E. Hawk Motor Co. of San Fernando, alif., has been appointed to handle the Max-ell line under Union Motors, Inc., Los Angeles.

well line under Union Motors, Inc., Los Angeles.

MacDonald Motors, Inc., of 44 So Raymond,
Pasadena, Cal., has been appointed Maxwell
dealer by Union Motors, Inc., Los Angeles.

The Chambers Motor Co., authorized Ford
dealer at Memphis, has moved into its home at
the corner of Calhoun and Rayburn streets, just
east of the Union depot.

The United Motors Corp. at 1220 Broadway, Nashville, Tenn., put on an automobile show the entire week of Feb. 19 to 24. The entire building was given over to a display of the 1923 models of Star and Durant cars.

The Ahlander Mfg. Co. of Provo, Utah, has been formed. The capital is \$10,000 and automobiles, motorcycles and supplies of all kinds will be handled.

Velie Auto Sales Co., Inc., Newport News, Va., has been chartered for general automobile and garage business. Maximum capital is \$25,000.

Eugene P. Bates, Buick dealer for the Green-ville, S. C., territory, has moved into a new building owned by himself and especially de-signed for his business.

T. J. Phillips and F. G. Harper will open a Ford agency at Hickory, N. C., under the name of Harper-Phillips Motor Co.

Waynesboro Automobile Co. has been chartered for general automobile and garage business at Waynesboro, Va.

The Loop Garage, Inc., is a new Minneapolis company capitalized at \$25,000 to operate a downtown garage. H. P. R. Greening is head the corporation.

Walter M. Oertlin has let the contract for a new garage and tire store on North Dearborn avenue, Kankakee, Ill., to be ready for occupancy June 15.

Fortin Bros. will start work at Kankakee, amediately on an addition to their large St immediately street garage

mmediately on an addition to their large Station street garage.

Mang-Zeisler will build a new garage for their rapidly growing Studebaker agency on the west side of Schuyler avenue, in the block south of Station street, Kankakee, Ill.

G. W. Boyd has let the contract for a one-story garage and salesroom on the east side of Schuyler avenue in the block between Station and Hickory streets, Kankakee, Ill.

Robert E. Parker, vice-president and general manager of the Packard Motor Car Co. of Boston, and Alvan T. Fuller, also of the same company, have bought the business of the Packard Motor Car Co. of Philadelphia and will represent the Packard in this territory. No decision as to choice of name for the concern has been announced as yet. W. Y. Anthony, formerly general manager of the Philadelphia company, will remain as treasurer and comptroller.

The Stutz Sales Co., Inc., has been organized

will remain as treasurer and comptroller.

The Stutz Sales Co., Inc., has been organized and incorporated in Atlanta, and has taken over distribution of the Stutz in the state of Georgia. Headquarters are at 239 Peachtree street, with John S. McClelland, president; Stewart Murray, secretary and treasurer, and Austin Abbott, identified with Stutz sales and service in Atlanta for many years, as general manger.

Davis Motor Car Corp., Chicago branch, has moved into its new headquarters at 2526 S. Michigan avenue. Better facilities and larger space is provided in the new location for both the sales and service department of the company.

The Edward Berkner Co., Fourth avenue S. and Sixth street, Minneapolis, is the new distributor for the Traffic truck. J. C. Barous, formerly salesmanager of the Traffic Motor Truck Co., is manager.

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BUSINESS NOTES

The Climax Auto Cap Co. has been incorporated at Provo, Utah. The capital stock is listed at \$200,000 in \$1 shares. It is organized to make and market a patented, self-opening radiator cap.

Towson Body Co. reports net sales for 1922, December estimated, of \$8,037,564 and net profits before taxes and after depreciation and interest of \$757,197. Earnings are now running at the rate of \$210,000 monthly.

C. M. Hall Lamp Co. shows total assets of \$1,690,898.10 and surplus of \$562,605.58 in its balance sheet as of Dec. 31 last. Current assets aggregate \$1,150,548.83 and current liabilities \$44,070.74.

Dort Motor Car Co. reports increased business in the first three months of its new fiscal year to average 161 per cent. Production plans at the factory have been adjusted to meet requirements of the new business.

ments of the new business.

The Wheeler Radiator & Mfg. Co. of Cleveland, making truck radiators, has appointed C. J. Edwards & Co. as general sales agents. C. J. Edwards and H. M. Block, located at 135 High street, Detroit, will cover the Detroit and Cleveland territories, while B. S. Pheiffer, vice-president of the sales company, will handle Chicago and surrounding territory from 531 First National Bank Bldg., Chicago.

Renewed production of the U. S. Quartermaster Class B Engine is annoused by Hinkley Motors, Inc., of Ecorse, Mich. The company was one of the largest producers of this engine during the war, since which it has served the Government as its source of Class B parts supply.

ment as its source of Class B parts supply.

The Connecticut Telephone & Electric Co. of Meriden, Conn., is preparing to erect a new factory building just as soon as weather conditions permit. It will be built of iron and concrete, and will add very materially to the company's large plant. The new building will be devoted to the general expansion of the business. The company manufactures Connecticut ignition for automobiles.

Fred Campbell Auto Supply Co., 2806 Locust street, St. Louis, has been appointed distributor in that city for D & B Silent timing gears, made by Dalton & Balch of Chicago.

W. E. Cohen, F. C. Durfey and N. E. Anderson of St. Paul have organized as the Ford Gas Gauge Co., capital \$50,000 to make this Ford car accessory.

A syndicate headed by A. L. Wheeler, Charles Snyder and L. J. Schott of Akron and J. J. Kent of Youngstown, has purchased for \$200,000 the plant of the Biltwell Tire Co. at Barberton and will re-open the factory within a few weeks. Biltwell has been in receivership for two years and the factory closed for that period.

The India Tire & Pubbas Co. of Abras control

The India Tire & Rubber Co, of Akron reports that a deficit of \$274,487, existing on its books on Dec. 31, 1921, was entirely wiped out by 1922 operations of the company and that \$143 was carried to surplus arter paying off the indebtedness. Net earnings of the company on sales of approximately \$2.000,000 were \$274,630.

Walter T Akers has been named receiver for

walter T. Akers has been named receiver for the Falor Rubber Co, of Akron, manufacturers of inner tubes. Upon application of Shelby Falor, president of the company and former Goodyear official, the original receivership under which Charles F. Schnee was named receiver, was abated and Akers was placed in charge of the company. According to Falor, the company is solvent, and the receivership was created as a matter of protection for the time being.

Manufacture of piston rings, pins and other

Manufacture of piston rings, pins and other gas engine specialties will be undertaken by the LaCrosse Motors Equipment Co., a new \$50,000 corporation organized by J. Magio, W. J. Hickisch and R. L. Chopiesky, who established a small shop in LaCrosse, Wis., several months ago and are now greatly enlarging the scope of their activities.

The Hardware Specialty Co. of Green Bay, Wis., has been incorporated under the laws of Wisconsin with an initial nominal capital of 500 common shares without par value, to manufacture and deal in automotive equipment, hardware and metal specialties of all descriptions.

The French Battery & Carbon Co. of Madison, Wis., experienced a 50 per cent increase in production and sales in 1922, compared with the previous year, according to reports presented to the annual stockholders' meeting.

The Moore Drop Forging Co., makers of drop forgings for automobile parts, has begun the erection of a new building for its Chicopee (Mass.) plant, to be used for heat treating.

F. C. Boyles, M. M. Chambler and J. B. Leathers, all of Greensboro, N. C., have organized and incorporated in that city a new company for the manufacture of springs and accessories, under the name of the Thompson Spring Co. The capital of the company is \$50,000.

Department of Commerce Calls Meeting of All Automobile Men

Seek to Secure Greater Cooperative Efforts in Industry; Leading Men to Attend

WASHINGTON, March 2—Representatives of automobile manufacturers, engineers, distributors and dealers, service men, car owners and business paper editors have been invited to attend a meeting called for March 9 at 704 Commerce building, Washington, by the Division of Simplified Practice of the Department of Commerce, at which it is planned to appoint a central committee representing these various interests to secure greater cooperative efforts along lines laid out by the department.

Four major objectives have been mapped out for the committee's consideration—better co-ordination of all current standardization activities, wider use and adoption of existing standards, broader application of the principle of simplification and greater support of the Hoover program of "government cooperation with industry." The Department of Commerce has worked along similar lines with the lumber, marine and container industries, with excellent results and it is believed that the same idea can be worked out successfully with the automotive industry.

As outlined in the call for the meeting, this suggested central committee would be headed by H. M. Swetland, president of the Class Journal Co., with C. A. Musselman of the Chilton Co. of Philadelphia as vice-chairman. It is hoped the rest of the committee can be made up of representatives from the National Automobbile Chamber of Commerce, the Motor and Accessory Manufacturers' Assn., the Society of Automotive Engineers, the Rubber Association of America, the Automotive Electric Assn., Automotive Metal Wheel Assn., Automobile Body Builders' Assn., Tire and Rim Assn., Motor Cycle and Allied Trades Assn., American Gear Manufacturers' Assn., National Association of Motor Truck Industries, Trailer Manufacturers' Association of America, National Bureau of Standards, American Society of Agricultural Engineers, American Automobile Assn., National Automobile Dealers' Assn., Automobile Electric Service Assn., Automotive Service Assn., National Association of Service Managers and other organizations identified with the indus-

Old Timer Returns to Olds As Assistant Chief Engineer

LANSING, Mich., March 3—J. T. Trumble, who in 1899 aided in building the Olds stationary gasoline engine, has just

returned to the Olds Motor Works as assistant chief engineer. In the course of his long career in the automotive industry Trumble has twice been an automobile dealer and has served as factory representative for various companies.

His first undertaks the selling of the ing as a dealer wa inder curved-dash original single-cyl

J. T. Trumble

Oldsmobile at Jackson, Mich. Later he became a traveling representative for the Buick Motor Co. and was then advanced to the position of experimental engineer for the company.

In 1909 he went to the Jackson Motor Car Co., and the following year again became a dealer. In 1912 he became chief engineer for Chevrolet Motor Co., leaving there to become chief engineer of the Stephens Motor Works. During the war he was chief engineer of the Samson Tractor Co., and since then has represented the Forsythe Wheel Co. and other equipment makers.

The Oldsmobile chief engineer is R. K. Jack.

TRAINLOAD OF TRUCKS

PONTIAC, Mich., March 3—Shipment of a trainload of motor trucks, said to be a record in the industry, in a single order, was made of Feb. 22 by the General Motors Truck Co. of this city to the Boston branch. The retail value of the 25 freight-car loads of vehicles was given by Vance H. Day, general sales manager, as \$160,005 exclusive of special equipment and bodies.

Sales of motor trucks are the most promising now that they have been in several years, according to W. L. Day, general manager. Orders received during the past month have greatly exceeded the schedule of production set at the beginning of the year. An interesting fact is that the proportion of heavy duty machines being ordered is higher than in some years.

WESTCOTT PRODUCTION UP

SPRINGFIELD, O., March 2—Rail lines are easing up on their embargoes and as a result the Westcott Motor Car Co. is able to make shipments that have been delayed for some time. Production is being increased.

KELLY-SPRINGFIELD STEPS UP

SPRINGFIELD, O., March 2—The plant of the Kelly-Springfield Motor Truck Co. is forging ahead. It is working three nights a week and prospects are that the night schedule will be continued. Pearl A. Lewis, receiver, says "Everything looks fine for the future." Production of 15 motor trucks a day is being continued at the Springfield works of the International Harvester Co., Supt. C. H. Smart reports.

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The READERS CLEARING HOUSE

Questions & Answers on Dealers Problems

Factors Governing Valve Timing

Q—Is the valve and ignition timing of an engine governed by the position of the piston in the cylinder, or the degrees of crank pin travel, or both? Is the valve and ignition timing of an engine affected by offsetting the crankshaft? Does the compression ratio, the speed of intake and exhaust gases and the valve and valve port and manifold construction affect valve timing? Is the connecting rod length considered in engine design, other than reduction of cylinder wall thrust? Have any racing engines been built with an offset crankshaft? Also are any stock passenger car engines built with a crankshaft of this type?

1—The design of an engine, the work it is intended to do and the speed at which it is desired to operate have more to do with the valve and ignition timing of an engine than the position of the piston in the cylinder. Thus the valve timing marks on the flywheel are merely there for convenience in measuring the travel of the piston.

Offsetting the crankshaft does affect the opening and closing of the valves. The valves should begin to open and close and a spark in an engine should occur when the piston is at a particular point of its stroke. Offsetting the crankshaft or cylinders has some rather peculiar affects on the function of an engine. To begin with the piston is not at the end of its stroke when the crankarm is in the vertical position. It reaches the end of the stroke a moment later when the crankarm and connecting rod are in line with each other.

In addition the two dead center positions are not 180 deg. apart as they are in a symmetrical engine. The connecting rod is parallel with the cylinder axis at some time after the top vertical position of the crank has been passed, and the same time before the bottom vertical position is reached. Since any particular point of the stroke corresponds to a different crank angle in an offset engine than in a symmetrical engine it is plain that these functions should occur at a different angular position of the crank in an offset than in a symmetrical engine.

Thus if a designer knows of a valve timing system which gives satisfaction in a symmetrical engine and wants to apply the same system to an offset engine he must first determine the piston position corresponding to the different crank angles used in the timing system of a symmetrical engine.

Valve timing in an engine is dependent upon a good many factors. For example,

The Readers' Clearing House

 T^{HIS} department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

if it is desired in an engine used for high speed work to hold the inlet valve open for a long period provision usually must be made for a larger manifold and carbureter to take care of the increased time of opening and desire to take in a full charge.

The reduction of cylinder wall thrust is probably one of the chief factors in governing the length of a connecting rod. The most obvious way of reducing the wall thrust of the piston on the cylinder wall is by increasing the length of the connecting rod. Old text books on the steam engines run at considerable length on the ideal engine with a connecting rod of infinite length in which, among other things, there is no side thrust on the cylinder wall. In practice however, the length of the rod is limited since the height of the engine must be considered and the weight increases rapidly with the length.

It is very likely that some racing engines have been built with offset crank-

shafts but we have no available material indicating this. Offsetting the crankshaft is not followed to any great extent in passenger car engines. The same results are accomplished by offsetting the piston pins, the Buick engine being a good example of this.

2—Is there any possibility of foreign entries, such as teams of Fiats, Ballots, Sunbeams, Rolland-Pilains, Bugattis or Delages at the Indianapolis race for 1923? —Chas. M. Saylor, Columbus, Ohio,

2—There is every likelihood that next year's Indianapolis race will see a good many foreign entries. The manager of the speedway is now in Europe negotiating with the foreign manufacturers.

GOVERNMENT OIL TESTS

Q—We are under the impression that the Government Aviation Department conducted tests and experiments during the war on the value of different makes of lubricating oils for use in airplane motors. We are under the impression that the lubricating value of various oils was found to differ as much as from 19 to 90 per cent. We are handling two oils and would like to know where we can get record of such tests. The only available information at present is what we can get from rival salesmen and this is not very convincing.—Michigan Subscriber.

We would suggest writing a letter to the Bureau of Standards, Washington, D. C., asking them for record of tests such as you describe. They can doubtless give you information of this nature. It is also possible to make a test of the lubricating quality of various oils by trying them out in a car. To do this the test should be repeated three or four times to make sure that the change of oil is responsible for any variations noticed in the operation of the car. The suggested method is to pick out a hill that the car can ascend with some difficulty. Then drain the oil from the crankcase and fill up with No. 1 oil.

Have the same man drive the car each time, starting at a definite point at the bottom of the hill and have the car driven to the top of the hill, noting the elapsed time and the speed at which the car is traveling when the top of the hill is reached. Then take the car down hill, drain out the oil and repeat with the No. 2 oil, making the test as nearly as possible like the first test. making this No. 2 test, again try out No. 1 oil and then follow it by making a test on No. 2. By alternating in this way and making three or four tests on each oil, it will be possible to tell whether the lubricating value is appreciably different.

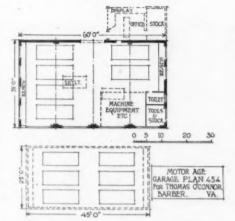
Small Garage For Repairing Only

Q-Having been referred to you by the American Technical Company, I wish information on the following subject:

I contemplate erecting a garage for state highways in the country. Have plenty of ground. Expect to erect a shop about 45x25 ft. or thereabouts, to ho six or eight cars. Also intend having ling of tools and equipment, such as drill press, arbor press, welding outfit and small lathe. Would also desire a small window.

At present I am doing open air busi-ness and am so busy that I am compelled ness and am so busy that I am compelled to build. I am therefore asking if you will furnish designs for a suitable shop or publish them in your valuable magazine?—Thos. O'Connor, Barber, Va.

You will hardly be able to take care of six or eight cars in a 45x25 garage. There would be room to get six cars in this space (see dotted diagram), and room to work on them, but no room for stock or equipment, and it would be difficult moving them into place without skid jacks. A building 35x60 ft. would be much better. It would handle six



cars easily with good space for machine equipment and a suitable aisle to get the cars in and out.

The accessories could be housed in a wing extending out in front, or the building could be made 8 ft. deeper and the store taken into the main building, one

Architectural Service

In giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelli-gent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

rge it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is

car being transferred to the other side

and the machine section reduced in size. If you have a six-car business in sight it will not pay to build barely large enough to hold the six cars because there is always other work to do that takes space and must be accommodated.

THIS ENGINE OVERHEATS

O-My 1920 Ford coupe overheats very badly and although I have tried various as related in the following paragraph have so far been unable to find a remedy. The cylinder walls are smooth and there is only .004 inches variation in the cylinder at the top. The magneto is O. K. and the compression also is good. When the engine is first started it works all right for about five minutes and then becomes sluggish and will often run after the ignition switch is turned off.

We have put in two sets of Ford pistons, and Ford rings, fitting one set loose and the second set tight. Both of the old sets of pistons were badly carboned up and the rings were stuck solid in a deposit of carbon. We have tried Rayfield carbureter and hot-spot manifold which helped this performance some but did not overcome the trouble due to heating. We have also put in oversize Fordson valves and timed the engine to We installed a the regular Ford setting. water pump and later reduced the pulley on same one-half so as to get increased

We have tried all kinds of oil, cork transmission bands to reduce friction, different type radiator, also boiled the original radiator and the cylinder block with different solutions, such as lye, bored out water holes in block and cylinder head three sizes larger, examined oil pipe, lowered oil splash pan by using old style pan and adding three gaskets. In spite of all these changes the engine still runs hot and knocks inside of five minutes. Aside from the conditions above enumerated the engine is A-1. It does 25 miles on a gallon of gasoline and 400 miles on a quart of oil. The gear ratio the rear axle is 3 to little carbon accumulates and the plugs are never fouled. The engine does not miss even when overheated. What do you suppose is wrong with this engine?-Wm. chnoor, care A. E. Wittman, Ford Agent, Humboldt, Iowa

One possibility is that there is a projecting piece of cast iron in the combustion chamber, possibly in the cylinder head which becomes red hot or incandescent and causes preignition of the gas mixture. Inspection of the cylinder head and combustion chamber will determine this of course if such a condition is present. Another possibility is that the spark is either too far retarded or too much advanced. If it were too much advanced however, you would probably find that it would kick when starting and possibly break the Bendix spring on the starting motor

Our personal preference in the matter of timing is to have the spark occur on dead center or with the piston about 1/64 in. down from dead center in the retard position. By this we mean with the spark lever all the way up. The upper position of the spark lever is then correct for starting and a point about 11/2 in. down on the quadrant is about right for running. The best way to check the timing is by having the switch turned to the battery position and the spark plugs removed. With the switch on, the engine can be turned over by hand until one of the coils just starts to vibrate. At this point it is possible to feel the piston position by inserting one's finger or a screwdriver to see if the piston has just barely started down on the firing stroke.

Another condition which will cause an engine to run very hot is operating with too lean a mixture and the fact that you are getting 25 miles to a gallon of gasoline would point in this direction. We would accordingly suggest that you try the operation with a slightly richer mixture. We would also suggest that you try rolling the car to see if there is any bind in the rear axle or emergency brake band. This is unlikely however, as you would notice such a condition by reduction in mileage and overheating of the rear axle.

We would suggest that you check the capacity of the cylinder block and radiator by carefully filling it and then dumping the water and collecting it in a bucket. Then take this same quantity of water and pour it very carefully into the cooling system of another similar car, which cooling system has been previously emptied for this purpose. It occurs to us that possibly a defective core in the cylinder block has limited the cooling by stopping up some of the water passages down in the cylinder block where you cannot see them. By checking the amount of water that the system will contain you can tell whether such is the case or not. This sounds like a genuine mystery tale and we would appreciate hearing from any subscribers who have ideas on the cause of the trouble related above.

Architectural Service Pamphlet

For several years MOTOR AGE has supplied an individual architectural advisory service to all of those who requested the assistance of this publication in building problems. This service has grown to such an extent that a special pamphlet, "Building Suggestions for Automotive Dealers," has been published by MOTOR AGE and is sent to automotive dealers on request.

If you have building problems before you we would suggest that you fore you we would suggest that you provide yourself with a copy of this pamphlet and see if it does not answer your questions. If, after reading this pamphlet, you still have questions, ask them.

Chevrolet Lubrication

Q—Explain the meaning of a junk ring in sleeve valve engine.

1-The junk ring of a sleeve valve engine is located on the removable cylinder head in much the same manner as the piston ring is installed on the conventional type of piston. The true name of the junk ring is a seal ring, as this ring's function is to seal the combustion chamber which is formed by the inner sleeve and piston. The ring also acts as a guide for the upper end of the inner sleeve and for this reason and the fact that it must maintain the compression. it is usually of considerably larger dimensions than the conventional type of piston ring. The width of junk ring on the average sleeve type engine will vary from 1/2 in. to 1 in.

2—Explain of what use baffle plates are, what are they for and how constructed and can they be put on any car?

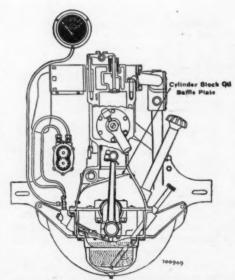
2-Baffle plates are utilized in an internal combustion automobile type engine for the control of lubricating oil. Briefly, they consist of sheet metal plates which are fastened either to the crankcase or cylinder block and which decrease the cylinder area at the bottom. thus preventing any excess amount of oil being thrown from the connecting rods into the combustion chamber. They are so constructed that a slot of sufficient length and width to allow movement of the connetcing rod is provided, the remainder of the plates being oil tight. An illustration showing installation of oil baffle plates in the Chevrolet "FB" engine is reproduced herewith.

3—Does the piston of an engine wear down to quite an extent? My idea was that the cylinder walls wear considerably more.

3—The piston of an engine wears, due to the fact that the piston is connected to a connecting rod which in turn connects with the crankshaft. The reciprocating motion thus imparted to the piston tends to slap or drive the piston against the sides of the cylinders and, although the piston rings tend to seal the piston and cylinder against leakage, it does not prevent the piston from making actual contact with the cylinder wall. There is also some liquid friction between piston and lubricating oil even when the piston is in a position parallel to the walls of the cylinder.

4—Explain the function of the Ford magneto generator located on end of crankshaft.

4—In the construction of the Ford magneto the north poles of two adjacent magnets are joined together, likewise the next pair of south poles. When the south poles are in front of the core of one coil the magnetic flux flows through the frame of the flywheel across and through into the next or adjacent coil to the south pole of the magneto. One-sixteenth of a revolution will bring a south pole in front of the same core and there will be a complete reversal of the magnetism. This reversal of magnetism



Circuit of lubrication in Chevrolet with particular reference to location of the oil baffle plate

induces a voltage in the series of coils. One end of this series of coils is brought out to a terminal while the other end is grounded.

5—In taking up the Ford main bearing I limbered up the crankshaft with heavy compound, got the bearings to a good fit and tightened the shaft on the main bearings one at time so that I could turn the crankshaft without the flywheel with one hand. Is this all right; if not, how tight should they be?—Wisconsin Reader.

5—Provided that the bearing at each journal on the crankshaft is perfect, the crankshaft may be fitted as loosely as desired. Generally speaking, however, the caps should be slightly tighter than you have fitted them. For further information regarding the fitting of bearings we refer you to an article entitled "How Should Engine Bearings Be Fitted?" was printed in the November 2 and November 9, 1922, issues of Motor Age.

REBUILDING A CHEVROLET FOR RACING

Q—We are building a race car out of a 490 Chevrolet. The work we are doing at present is on the engine. We are using a cylinder head from an Oldsmobile truck, with the valve ports cut out with a valve seat tool and Cadillac eight valves installed. We had off center rocker arms made so as to open the valves from 5/16 to 7/16 inches. We would like to know whether the standard camshaft should be used with these rocker arms or whether we should use a special one and also where it can be obtained.

1—A special camshaft will be best for racing. The standard camshaft has an inlet valve that closes at approximately 52 deg. after bottom dead center. On a racing camshaft the inlet valve should be open much longer, closing about 80 deg. after bottom dead center. The name of a concern that can supply special camshaft will be given by letter.

2—We are using a Bosch high tension magneto with this engine. At what stroke of the piston should the spark occur?

2-This is a matter of experiment. In the retard position of the magneto inter-

rupter you can probably have the interrupter points open when the piston is coming up on the compression stroke and is within 1/32 in. of top dead center. This means that the magneto will be advanced a little bit in the retard position and further movement of the interrupter housing will give you more advance. The only limit to the advance in the retard position is the point that you reach where the engine kicks so that you cannot get it started. The running position for the interrupter however you will have to find by experiment.

3—We are figuring on using two small Zenith carbureters, such as are used on the 490 Chevrolet. Would it be well to do this or would it be better to use one larger Zenith carbureter?

3—A test of both methods would probably be necessary to determine absolutely which was the best. Conditions would be affected somewhat by the manifold arrangement. Additional information will be given by letter.

4-We wish to use a drilled crankshaft in this engine. Where can one be secured?-L. L. Schenk, Keokuk, Iowa.

4-This information will be given by letter.

BUILDING A SERVICE CAR

Q—We have considerable use for a service car but find the expense of operating a powerful car makes such a car out of the question. We have in mind taking a small car such as a Maxwell, Chevrolet or Dort and installing under it a 1914 two-speed Cadillac axle. We would also cut down the wheel size to about 31x4. It is our opinion that the high gear could be used for running around and the low gear for pulling. We would like to know what the gear ratio in the Cadillac axle was and what gear ratio we would get by cutting down the wheels. We would be satisfied with about 5½ to 1 on low.

1-The two gear ratios in the Cadillac axle were 2.5 to 1 and 3.66 to 1. The axle would therefore be unsuitable, as the 3.66 ratio which gives you the greatest pulling power, is about the same as a standard Maxwell car would have. In other words, this axle would be all right if you were trying to build up a car for high speed, but it is just the wrong thing on a car that has to do heavy pulling. It is possible that you can get hold of some axle which has a transmission built in it and then use with it a unit power plant which also has a transmission. This would give you two transmissions in series with each other, so that you could get an enormous gear reduction if you wanted it. The Cadillac proposition, however, would be unsuitable for your purpose even with the wheels cut down.

2—Could you send us a sketch of the connections required for using a Ford coil as a test coil? We do not keep a file of Moros Agr although we keep certain diagrams. We believe that this was given in an article entitled "Old Timers Test Coil."—C. R. Thorsell, Westwood, N. J.

2—A copy of the article in question is being sent you by letter.

Poor Connections Cause Trouble With Charging Outfit

Q—We have a Tungar 10 battery charging outfit that is giving us some trouble. With this outfit it does not make any difference whether we have on one or more batteries, it is hard to get it started charging. It does not start charging until we turn up the rheostat from 6 to 8 points and then it starts and jumps up to 15 or 20 amperes, which must be hard on the bulbs.

Could you tell if that is the way it is supposed to work and if not what may be wrong and what should be done. We have tightened and cleaned all connections and points but it seems to make no difference. After turning up the rheostat and having the current suddenly jump up to 15 or 20 amperes we can reduce the current to 2, 4 or 6 amperes by turning the rheostat back again. We are afraid however that this condition will result in short life in the bulbs. Teigen & Brantseg, Sisseton, S., D.

Although you say you have cleaned up the connections, we believe that the most likely cause of the trouble is at this point. It is possible that you are using a type of clip which pinches on the post of the battery. If this is the case, you may have connected the wires to these terminal clips by the ordinary screw that is designed for this purpose. A better way is to securely solder the wire to the clip.

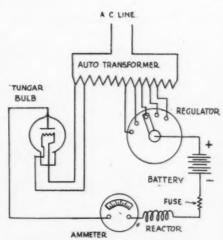
We would, accordingly, suggest that you make an experiment by taking three or four of your battery connectors and soldering the wire securely to the clip at each end. Then boil these connectors in soda water. This is ordinary baking soda put in water. This will remove the

acid corrosion from them and you then might file up the sharp jaws in each clip to make sure that they will dig into the battery post. Then take a file or pair of pliers or similar instrument and scrape the battery posts until they are clean, so that you know you will get a good connection. Then connect up three or four of these batteries on which the posts have been cleaned and use the connectors that have been soldered, boiled and scraped, and see what results you get.

From the symptoms described, there is not much question but what the trouble is caused by a poor connection, although there is, of course, a faint possibility that such a poor connection is actually inside of the rectifier itself.

If your experiments as above suggested do not eliminate this condition we would suggest your referring to the diagram of the rectifier as illustrated herewith. This diagram is taken from another article published in the July 6th, 1922, issue of Motor Age and shows the general principles by which the charging rate in a Tungar rectifier is varied. It may or may not be exactly correct for your outfit, but will show you the general scheme.

You will notice that the battery charging circuit includes the ammeter and a reactor which is merely a coil wound on a piece of iron, and also includes the connection at the top of the tungar bulb. It might be well if you would remove this connection and sandpaper the contact surfaces. Another possible location of trouble would be in the connections at the back of the rheostat handle. The nature of a poor connection is usually



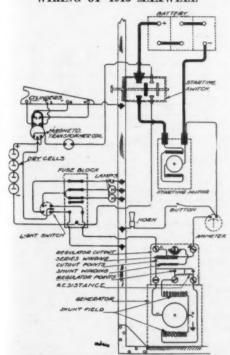
METHOD OF CONTROLLING CHARGE RATE IN TUNGAR RECTIFIER

Method of Controlling Charge Rate in Tungar Rectifier.

such that it may entirely prevent current being sent by a low voltage.

However, when a higher voltage gets the current started it is then possible for the lower voltage to keep it going. This accounts for the results you obtain where you first turn the rheostat or regulator handle and get such a high voltage that you get 15 or 20 amperes charge. The current flowing through the poor connections can then be reduced and as long as the current continues to flow, the poor connection will operate to carry the current. We hope you will carefully check up the battery connections as above outlined first, and only as a last resort look for trouble in the rectifier itself.

WIRING OF 1915 MAXWELL



Q—Publish a wiring diagram of the Gray & Davis system used on a 1915 Maxwell.—A. J. Davis, Miami, Ariz.

Diagram is published in accordance with your request.

SOME SUGGESTIONS FROM A READER

The following letter was received from one of our subscribers and as the contents may be of interest to some of our readers we are publishing it herewith.

"I am going to offer some suggestions of my own experience on carbureters and starters. I have read a lot in your magazine of trouble that some are having with carbureters spitting, and are unable to locate the trouble, outside of worn mechanical parts. I have had several kinds of carbureters to put in working order, and some jobs that have been given up by others, and in about every case I have found either a little water that sometimes accumulates in the gasoline, a quantity as small as three or four drops, or else I have found the high speed spray nozzle clogged. After these were removed the carbureter seemed to work O. K. As the high speed spray nozzle has a very small hole, it is very easily clogged, and I have found this with good screens in the carbureters.

"In two cases, both being new cars, sometime after the cars were used, the starters refused to work properly, that is, they either would turn very slowly or else not at all. You know when any one has a new car and something like that goes wrong it causes an ill feeling, but in the two cases I had, the bad action

of the starters took place all of a sudden, and there was not much the matter either. It was that the bearing on the commutator end of armature got gummed up and it was almost impossible to turn the armature by hand, but I thought it strange that such a thing took place all at once in both cases. A little kerosene to cut the gummed oil and a little lubricating put them in working order. think there are a lot of car owners that are having similar trouble to that, as a lot of them never oil their starters, and the electrical troubles are sent in to be solved. A little oil will do a lot towards making things run.

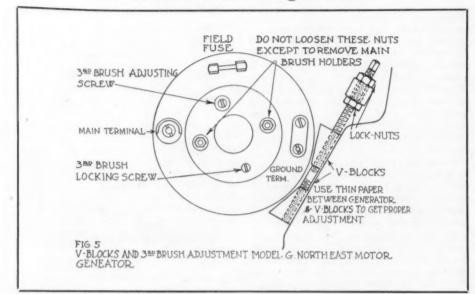
"I have also found in carbureter spitting, trouble in a vacuum tank, a job that was given up by another, and the trouble was that the inner cup where the float is fastened to had a hole rusted in it, and this caused the motor to spit in the carbureter, the motor would run but would not speed up.

VALVE TIMING ON 1916 FRANKLIN

Q—Give us the proper valve timing on a Franklin 1916 model.—H. M. Pollock & Son, Olds, Iowa.

Intake opens 8 degs. before top dead center and closes 49 degs. after bottom dead center. Exhaust opens 51 degs. before bottom dead center and closes 17 degs. after top dead center.

Information on Dodge Clutch



Q—When a Dodge clutch slips, does it hurt to put in fullers earth after it is washed out with gasoline, to dry it, and does it affect the steel and will it wear out any bearing if it gets in there.

1-It is not advisable to apply fullers earth to a multiple disc clutch where there is liability of the fullers earth reaching the throwout bearing. Fullers earth has a very slight abrasive action and although it will not completely wear out a bearing, it does some harm and it is not advised to use this compound unless absolutely necessary. After washing out with gasoline, it is advisable to block the clutch in the disengaged position and assist the drying of the gasoline by use of compressed air. If compressed air is not available, the clutch will dry in about half an hour if the clutch discs are separated by means of depression of the clutch pedal.

2—In replacing the discs, that is, in the 1918 models and later, which is the best procedure, to take out the engine or the rear end, and how would you go about it?

2—The first step in removing a Dodge clutch is to disconnect the rear axle from the springs and disconnect the ball cap cover at the end of the transmission. When this and the brake rod connections have been disconnected it will enable the rear axle to be moved back sufficiently to remove the clutch and transmission assembly.

In order to permit the discs to be removed, it will be necessary to compress the clutch spring and remove the collar which holds it. This can be accomplished by using a piece of pipe about 1% inches in diameter, cutting two slots in it which can be used engaging the split washer. Leverage can be gotten by the use of a 2 by 4.

3—How can the cranking of gears be stopped in a Dodge transmission?

3—As you have already stated that the clutch has been frequently washed out with gasoline, the first impression we receive is that the dragging of the clutch was not due to dirt between the discs. However, it is apparent from your letter that fullers earth has been applied to

the discs and if this has been done it is undoubtedly the cause of the dragging of the clutch. If the clutch discs are fairly clean and are not frayed or raveled, it is advisable to loosen the adjustment on the clutch to prevent the clashing of the transmission gears.

Adjustment on the Dodge clutch is secured by compressing the clutch spring sufficiently to allow the split washer which fits into one of the three grooves to be moved. If the split washer is in the front groove, we would advise that you remove it to the center groove and then try the clutch, and if it still continues to grab, would suggest moving it into the third or last groove. Care should be taken that the two halves of this split washer fit securely into the proper groove on the clutch shaft and that the clutch spring collar fits snugly around the split washer.

4—Send a diagram of the generator on a Dodge to put in new brushes and to set it to charge more with the engine running at low speed.—Twente's Repair Shop, Napoleon, Mo.

4-Illustration showing method of adjusting the charging rate of the Northeast motor generator is shown in Fig. 5. Each of the three brushes on the starter generator can be readily replaced by removing the two screws which secure them to the holder. These screws are rendered accessible by removing the inspection cover band from the housing. In applying new brushes, the third and main brushes must never be transposed. Each is peculiarly suited to the duty required of it and neither will give good service if used in the place of the other. The difference in color serves as the simplest means of distinguishing the two types of brushes from each other. The main brushes are yellowish white, the third brush is black.

SELL CUSTOMERS ON SHOP EQUIPMENT

In selling service, either in newspaper ads or whatever medium you choose, why not sell the customer on your equipment? Your tools and facilities represent a more or less big investment to you, and telling the customer what each piece of equipment does in making your service department pay should be a part of your merchandising plan.

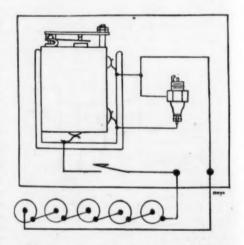
More owners than you have any idea are interested in what "this thing" is or what "that thing" does—change this uncertainty of calling them "things" into knowing what they are and what they do. You know how well and how quickly each tool does its work, and advertising your place as a "completely equipped" shop and backing it up with pictures and educational matter is selling the industry as a whole and making the car owner and his car closer friends.

A great number of car owners are under the impression that the service station is something of a torture chamber for their dearest possession—their car. Lift this veil of secrecy from your shop by advertising and explaining how your equipment enables you to do the work much cheaper, much better and much quicker than the poorly equipped shop.

CONNECTIONS FOR A SPARK PLUG TESTER

Q—We would like to have you send us a drawing of a spark plug tester made from four dry cells and a Ford coil. We have tried hard to make one but do not seem able to get a spark at the end of the plug and a buzz from the coil at the same time. We have seen one made up and put in a small box that worked very nicely and would like a drawing of this tester.—Ross J. Frederick, Meco, N. Y.

We are showing an illustration that gives the connections you need. You can make the device on a flat board and



build a wood framework somewhat larger than the Ford coil. You can then use three pieces of spring brass bent as shown to make contact with the terminals on the Ford coil. You can also use binding posts as shown at the lower right-hand corner and a switch as indicated. You will find five dry cells a little better than four, or you can connect up a 6-volt battery. The test is not a conclusive one, but is a little more severe on the plugs if a piece of mica is put between the points so as to force the spark to jump a greater distance.

Lighting a House With Automobile Generators

Q—Tell me if it is possible to light a small house with three automobile generators taken from old cars and three automobile batteries, running the generators from a line shaft with a gas engine.

1—This is a possibility, and we have illustrated the necessary circuits by means of a diagram. We have shown three generators and three cut-outs, also three ammeters which show the charging current and a fourth ammeter which would show discharge current used by the lights. If any of the generators have cut-outs in them, the external cut-out will not be needed. Note that negative battery terminals are all connected together and are also connected to the frame of the generator and the frame of the cut-out.

We are assuming the generators are all of the grounded type. If not, one of the ground connections would go to one of the terminals instead. Assuming you have three 80 amp. hr. batteries, you could use 16-21 c.p. headlamps for five hours before they would run down. This would be drawing 48 amp. from the battery set for five hours. The charging rate of your generators will be about 12 amp., so that with all of them being driven you can charge at the rate of about 36 amp. With the batteries entirely discharged to 1150, it will take ten or twelve hours to bring them back

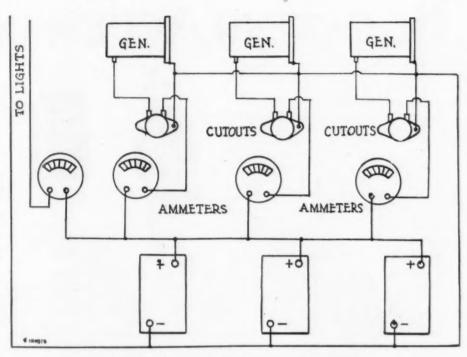
PECULIAR NOISE FROM STARTER

Q—When using the starter in a Buick D-45, as soon as the engine fires and the foot is taken off the starting pedal there is a whiss which seems as though the starting motor or some of the gears were running at exceedingly high speed. We took off the starter gear case cover but found all gears in good shape and also found that they slipped into and out of mesh very easily. The spring tension is also strong enough to pull the small gear out of mesh with the flywheel teeth. There is however a little up and down play in the rear bearing of the starter shaft.

Could this play bind the gears in any way and cause them to fail to come out of mesh. It seems to us that when the engine fires the small gear does not come out of mesh with the flywheel readily enough and the engine then drives the starting motor at an awful speed (the starting motor having a one-way clutch) which causes this whissing noise.—D. C. Slick, Granite City, III.

There are two clutches in the motor generator in question and you have apparently overlooked one of them. The clutch you have overlooked is in the large gear which acts as an intermediate gear between the pinion on the starter shaft and the flywheel itself. The overrunning clutch in this gear is intended to prevent the action you experience.

When the starting motor is driving the engine this clutch in the large gear holds and makes it possible to crank the engine. When however the engine begins to fire the clutch is supposed to slip. It is most likely that this clutch has not been oiled for a long time. It should be taken apart once a year and



Charging batteries with three generators at once

packed with a rather soft grease. It is possible that you can take this clutch apart and correct the trouble by suitable lubrication, on the other hand you may find a new gear is required. The trouble is not as you suppose in difficulty getting the small gear out of mesh with the flywheel as it is humanly impossible for the operator of a car to take his foot off of the starting pedal in time for this to happen.

When the engine starts it starts in a hurry and it only takes a short time for the engine to bring the starting motor up to very high speed if no means is provided for preventing such occurrence. You had better have this condition corrected or a new clutch gear installed at the earliest possible moment as high starter speed is likely to throw the wires right out of the slots and wreck the armature and field coils.

INCREASING SPEED OF FALLS ENGINE

Q-What is the r.p.m. of the Falls engine as used on a 1920 model Velie?

1—The maximum r.p.m. is 3000, but the greatest h.p. is attained at 2400 r.p.m.

2—Will the cylinder head from a 1918 model Grant using the same engine fit the Velie model of the same make?

2—According to our records the 1918 model Grant used a Grant engine. It is of course possible that this was a Falls engine, made to Grant specifications. Under the circumstances however, we cannot say definitely as to whether the cylinder head from the Grant would fit on the Velie or not.

3—How much oversize can the valves be made in the Velie model and how much much oversize in the Grant model?

3—Cylinder blocks generally have enough spare material so that the valves

can be enlarged 1/8 in. on the diameter safely.

4—How much material can be taken off of the cylinder head in order to increase the compression?

4—It is best to start by taking off 3/32 of an inch and if the compression is not too great an additional 1/32 can be removed.

5—Give name of a company that is equipped to grind a camshaft to increase the valve lift and change the valve timing of the Velie model of the Falls engine.

5—This information will be given by letter.

6—How much can the speed of this engine be increased by using lighter weight pistons, increasing the compression, making the valves 1/16 inch oversize and increasing their lift 1/2 inch?—Artie Pyle, Benton, Ill.

6—We would estimate a 20 per cent increase in speed. To have the engine stand up however, at high speed it is essential to have the crankshaft and flywheel assembly carefully balanced both from a static and a dynamic standpoint. This usually requires the services of concern building crankshafts, where the necessary balancing equipment is available. It is also necessary to balance the pistons, that is, have them all the same weight, and the connecting rods should also be balanced.

Surplus material should be removed from the outside of the connecting rods either by filing or milling and they should weigh the same at corresponding ends.

PISTONS NOT INTERCHANGEABLE

Q-We would like to know if a piston for a model K-45 Buick will work in a model 1923-45 Buick.—A. E. Hudson, Prop., The Park Garage, White Hall, Ill.

These pistons are not interchangeable.

BOOSTING ACCESSORY SALES

The first warm days of March—there are always a few at the beginning—brought out all of the old busses from last year and the new ones, too.

The man who bought his car last year and didn't buy a bumper or someting else because he didn't have the money, is the man who is now a prospect for a complete line of extra equipment.

The Essandee Glo-Lite is the product of the Essandee Corp., 330 West 16th street, Los Angeles Calif., and attaches to all models of moto-meters. The feature of the device is that it makes the dial of the meter visible at night from the driver's seat. It sells for \$3.50.

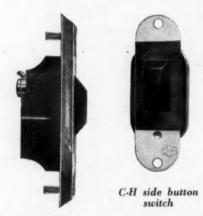


Essandee Glo-Lite

The Exlo Steering Post Control may be installed on any Ford car without replacing or changing any of the Ford standard equipment. It enables the Ford driver to steer and handle his car with greater ease and does not eliminate the flexibility of the Ford steering gear. It is said to absorb the road jars and keep the front wheels constantly in line, until they are turned by the driver. It sells for \$7.50 and is made by Exlo Products Co., Indianapolis.



Exlo steering post control



To their line of C-H Push Button Automobile Switches, the Cutler-Hammer Mfg. Co. of Milwaukee has added a new Slide Button Switch which is best adapted to enclosed cars because the shallow construction eliminates the necessity of deep recesses in the pillars. The operation is by means of a slide button, which is moved up and down to close and open the circuit. This tapered slide button harmonizes with the interior car construction and does not protrude.

The, cut shows the switch with and without plate. The current carrying parts are located in a heatproof C-H Thermoplax insulation body with the terminal screws at the back. Single pole types and three-way types for use on connection with door switches are made.



Brinck tire rim tool

Brinck Mfg. Co., Moline, Ill., has produced a tire rim tool, the feature of which is the wide range, fitting all rims from 30x3½ to 37x5. Gear and ratchet construction which effects greater torque and the double grip which elimina:es possibility of rim contortion and slipping off. The retail price is \$3.95.

The Sav-Oil Ring Mfg. Co., 1037 S. Figueroa street, Los Angeles, Calif., has recently put on the market the Sav-Oil Piston ring which is so constructed that when the piston goes up on the compression stroke, the lost compression strikes the bevel edge of the ring. The ring collapses and skips a large portion of the oil on the cylinder walls. On the

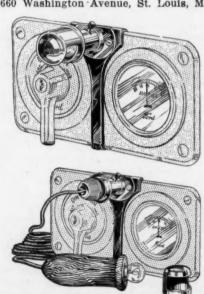
downward stroke of the piston the ring expands and wipes the surplus oil back to the crankcase. To allow the ring to collapse freely, the piston groove is drilled with six eighth-inch holes, releasing the vacuum back of it. One Sav-Oil ring, as an oil regulator only, is used on each piston in installation.



Moon single cylinder pump

Moon Single Cylinder automobile pumps are made by the Moon Bros. Mfg. Co., St. Louis, Mo. and sell at \$1.50 and \$2, both pumps are featured with a self oiling washer and weigh 2½ lbs. each. The model shown in the cut is the \$1.50 pump.

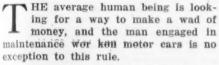
Clamp-on-Dash and Trouble Light for Fords combines a garage light, trouble lamp and dash lamp. The whole fixture is clamped onto the instrument panel in the center between the two instruments. When using the trouble light the shade is removed, bulb taken out and the attachment plug inserted. Made of steel with black enamel, fittings nickel plated brass. The dash light is \$1.50 and the trouble light \$1.50. R. D. Boyd Corp., 2660 Washington Avenue, St. Louis, Mo.



Clamp-on dash and trouble light

Getting a Patent and Making It Pay

The "Get-Rich-Quick" Illusion Corrected Necessary Legal Steps



The impression seems to prevail among a large class of mechanics in the various dealer establishments throughout the country, that if they can invent and patent some device for a motor car, that from that time forward their only worry will be how to spend the proceeds.

Few persons realize that the finest idea in the world is not worth a cent unless enough money and advertising is put behind it to prove to the world that it really is valuable. Then and only their can the idea develop and show a profit. It is regrettable that the man with real ideas is so handicapped, but it seems to be the case nevertheless.

The editorial department of Motor Age receives frequent letters in regard to all sorts of inventions, most of them merely foolish. One man claimed to have a clutch which had no plates or cones, and also acted like a transmission although having no gears. He did not even have a sketch of the device, but wanted our suggestions as to collecting on it. Perhaps he figured the engine would use a pipe wrench for grabbing the propeller shaft.

If You Have a Valuable Invention

If you have a real, valuable invention my best advise would be to get a good patent lawyer to handle your application for patent, because it may be that the invention would not be properly set forth in the application and claims if you attempted to secure the patent yourself and you were not an expert in preparing the specifications and claims. After an invention has been patented, the patent is always subject to attacks upon its validity and then a court may declare it invalid. Dealings with a patent are always nazardous unless passed upon by the Supreme Court of the United States.

If you own a patent and say you are manufacturing a device or product under this patent you may be infringing on another patent and liable for all your profits at least to the owner of the valid patent. If you buy a patent that has never been declared valid by the proper court you may get nothing but a lawsuit with the loss of the profits you might be able to make. A patent gives its owner a legal monopoly, providing it

is a valid patent. Hence they often are bitterly contested.

These difficulties are often not well understood by the layman and he is misled. Now it will be seen that a lawyer can only aid in preserving the proper claims of an inventor. Falling to make either a proper disclosure and claim might prove disastrous to the patentee. These general statements are made for the benefit of any interested in a patent in any way.

The patent office should send you upon request its rules for making application. It will not respond to inquiries as to whether an alleged invention is patentable in advance of the filing of an application.

A patent may be obtained by any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new or useful improvement thereof, not known or used by others in this country before his invention or discovery thereof, upon payment of the fees required by law.

Apply to Commissioner of Patents

Application for letters patent must be made to the Commissioner of Patents, and must be signed by the inventor if alive, accompanied by the first fee of \$15, together with a petition for the patent, specification of the discovery or invention all under oath, and drawings, model, or specimen, when required. Each application will be given a serial number, and it must be completed and prepared for examination within one year, after the filing of the petition. It is desirable that all parts of the complete application should be deposited in the office at the same time, and that all papers embraced in the application should be attached together. A complete application comprises a petition, the specification and

The petition must be addressed to the Commissioner of Patents, and must state the name, residence and postoffice address of the petitioner requesting a grant of the patent, designate by title the invention sought to be patented, contain a reference to the specifications for a full disclosure of such invention, and must be signed by the applicant.

The specification is a written description of the invention or discovery and of the manner and process of making, constructing, compounding and using the same in full, clear and exact terms. It must set forth the precise invention and

explain the principle thereof, and the best mode in which the applicant has contemplated applying that principle, in such manner as to distinguish it from other inventions.

In case of a mere improvement, the specification must particularly point out the parts to which the improvements relate and must, by explicit language, distinguished between what is old and what is claimed as new. The description and the drawings as well as the claims should be confined to the specific improvement and such parts as necessarily cooperate with it.

The specification must conclude with a specific and distinct claim or claims of the part, improvement or combination which the applicant regards as his invention or discovery.

1—Preamble, stating the name and residence of the applicant and the title of the invention.

2—General statement of the object and nature of the invention.

3—Brief description of the several views of the drawing (if the invention admits of such an illustration).

4—Detailed description.

5—Claim or claims.

6—Signature of inventor.

7-Signatures of two witnesses.

The specification must be signed by the inventor, or if he be dead by his executor or administrator, and the signature must be attested to by two witnesses.

The applicant must make oath that be believes himself to be the original and first inventor, that he does not know and does not believe that same was ever before used or known.

Owners Supply Prospect Names

By making it wor't while for Nash owners to turn in the names of prospects, the Nash-Buffalo norporation, which distributes the Nash car in Buffalo and the territory surrounding that city, gets in touch with many persons, whom it speedily converts into Nash owners.

The company gives Nash owners \$20 for the name of each prospect to whom a car is sold within 30 days after his name is submitted; \$15 for the name of each prospect to whom a car is sold within 60 days after the receipt of his name, and \$7.50 for the name of each prospect to whom a car is sold within 90 days after his name is turned in.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Harrisburg, PaThirteenth Annual Automobile Show	Mar.	3-10
Ft. Worth, TexAnnual Spring Show		
Anaconda, MontAnnual Automobile Show	Mar.	3-10
IndianapolisIndianapolis Trade Association	Mar.	5-10
Bay City, Mich		
Duluth, Minn Duluth Automotive Dealers' Assn	Mar.	5-10
Flushing, N. Y. Third Annual Queens County Show		
Amsterdam, N. Y. Annual Automobile Show.	Mar.	5-10
Carlisle, Pa Chamber of Commerce Show	Mar.	5-10
Nashville, TennAnnual Automobile Show		
San Antonio, Tex Annual Automobile Show	Mar.	5-11
Galesburg, Ill. Annual Show		
Fairmont, W. a. Annual Automobile Show.	Mar.	6-10
Huntington, W. VaAutomobile Show	Mar.	6-10
Oswego, N. YAnnual Automobile Show	Mar.	7-10
Saginaw, MichAnnual Automobile Show	Mar.	7-11
Wisconsin Rapids,		
WisCentral Wisconsin Automobile Show	Mar.	8-11
Elizabeth, N. J Fifth Annual Show	Mar.	8-17
Richmond, VaAnnual Automobile Show	Mar. 1	10-17
BostonAnnual Automobile Show	_Mar. 1	10-17
Newark, N. JAnnual Automobile Show		
Washington, D. C Spring Show, Convention Hall		
Denver, ColoAnnual Automobile Show		
Uniontown, PaAnnual Automobile Show	Mar. 1	12-17
Port Huron, Mich	_ Mar.	12-17
Jacksonville, IllJacksonville Automobile Dealers' Assn	Mar.	12-17
Great Falls, Mont. Eighth Annual Show.		
Greenwich, ConnAnnual Automobile Show		
Denver, ColoDenver Automobile Dealers' Show		

Quincy, Ill. Annual Automobile Show Mar. 14-17
Kingston, N. Y
Cumberland, MdAnnual Automobile Show
Battle Creek, Mich. Mar. 19-24
Monmouth, IllMonmouth Spring Festival
Greenville, S. C. Annual Automobile Show Mar. 28-31
Bridgeton, N. J. Eighth Annual Automobile Show Mar. 31-Apr. 7
Auburn, N. Y. Annual Automobile Show April
Eau Claire, Wisc. Annual Automobile Show
Alpens, Mich Apr. 2-7
Red Bank, N. J. Eighth Annual Show May 7-12
New YorkSpring Automobile Solon, Hotel Com-
modore
Green Bay, Wis Annual Automobile Show. Aug. 27-30
Sacramente Annual Automobile Show. Sept. 3-8
Memphis Annual Automobile Show. Sept. 28-30
Fresno, Calif Automobile Show Sept. 28-Oct. 5
Little Rock, Ark Annual Automobile Show Oct. 8-13
Waco, Texas Waco Automobile Dealers' Assn. Oct. 20-Nov. 5
CONVENTIONS

Quincy,	IllAnnual Meeting Illinois Automotive Trade
Dakland,	
Olympia	

RACES

Indiana	polis	*************	Annual	500	Mile	Inte	rnational	SweepstakesMay	30
Tours,	Franc	ce	Grand	Prix	500	Mile	Race	Jul	y 2

SQUEEKS & RATTI

Cutting Loose

Cutting Loose

Did you ever watch a river, that's been frozen stiff All winter, when the sun first starts to hit it in The Spring? Watch the way it starts to warble, then It slowly starts to ripple, then cuts loose and starts To thunder like a storm? Neither have we. But the poets Who have told us of the antics of the river, have told Us of the things you ought to do. After standing still All winter, it is time you beat it into things and cut Loose with lots of thunder in your stuff. Let the People know you're living and you're out to get their Money, try the river's stunt of simply cutting loose.

—J. V. M.

2300 Years Ago This Week In The Stone Age

A new sport model chariot was introduced by the Alexandria Chariot Works. The first one sold was to one of the Ceaser's at the first annual Chariot Show in Rome. Some of the refinements offered were lighter wheels made of Nilestone, weighing 54 pounds each, a four-passenger platform in place of the two, a roomier drivers' compartment and a six-horse shaft. Few new models were introduced at this show, which was featured by a race of some of the older chariots, in which one James Murphy finished first.

Much agitation about the finding of a king in a tomb in gypt. Wonder what someone will think when they find some of our kings in later years. Likely, they will say, "Poor fellows, wotta life they must've led."

The Worst Customer I Ever Dealt With

Was a guy, who, after I had changed a tire for him, after he had had a blowout in front of my place, came back to me in half an hour, kicking because he had had another one on the tire I had changed. I didn't charge him anything for changing the tire and he blamed me for both blowouts.—Lew Brication.

Who was the worst customer you ever did business with? Tell us about him.

IF YOU HAVE NOT

sent your contribution to Squeeks & Rattles this week, don't do anything else until you do.

Once upon a time, there was a man who wanted to trade in an old car on a new one, who did not have an offer from some other dealer for twice that which you wanted to give him.

Other Fables

Once upon a time there was an autoist who, when pinched by a motorcycle cop, bragged that he was going faster than the officer claimed.—"Aesop's Film Fables."

Once upon a time there was a garage mechanic who had grease on his hands and failed to wipe them on somebody's automobile cushion.—Baltimore Sun.

"Cut Loose" and send us a fable.

Once upon a time we had minute men who rode on horseback; now we have mile-a-minute men who ride in highpowered automobiles.—"Aesop's Film Fables."

Once upon a time we asked an automobile bug what made him limp when he walked, and he did not reply that one of his cylinders wasn't firing.—Arkansaw Thomas Cat.

Who'll Pay the Shipping Charges, Don?

The advertisement which follows was clipped from a recent number of Motor Weekly, which is published in Blomfontein, Orange Free State, South Africa:

HUPMOBILE, 1913-14 Model, five-seater, owner driven. The old Model has never been beaten. Cash £150. A bargain. Inspection invited.—E. Proctor, Kingwilliamstown.

If a 10-year-old Hubb.

If a 10-year-old Hupp can be sold for \$750 (£150), why not ship all our used cars to South Africa?

Now that Squeeks & Rattles has been in the movies, we feel like we have accomplished our main ambition. The only remaining thing to do is to get mixed into some scandal and listen to the world acclaim us a star.

Reports from the spring training camps where baseball players are going through the year's preliminaries would make it seem like many a poor old grand-mother is going to die this summer.

What sort of spring training is your team going through?

To be sure, to be sure

These individuals who always are being tossed into the adjacent township while trying to beat a locomotive to the grade crossing—aren't they the same persons who have been heard to say, "Oh, I don't read the newspapers; I just glance over the headlines?"—Detroit Motor News.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	-	RES	Final Drive	NAME AND MODEL	Tens	Chassie Price	Bore and Stroke	Front	RES	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Fina Drive
Ace. 40 Ace. 60 Acme. 20 Acme. 30 Acme. 40 Acme. 60 Acme. 60 Acme. 90	21/9-3 1 11/4 2 3 3 41/4	\$2400 2850 3400	35/4x5 41/6x51/4 41/6x51/4 33/4x5 33/4x5 33/4x5 41/6x51/4 41/2x51/6	34x3½ 36x4 36x4 35x5n 34x3½ 34x3½ 36x4 36x4 36x5	34x6 36x7 36x8 35x5n 34x5 34x5 36x7 36x7k 40x10	W W W W W W	Corbitt. E-22 Corbitt. D-22 Corbitt. C-22 Corbitt. B-22 Corbitt. R-22 Corbitt. A-22 Corbitt. AA-22	1½ 2 2½ 3 3½-4	\$1480 2200 2600 3000 3200 3800 4500	34x5 334x5 414x514 414x514 414x514 414x514 414x514	34x3½ 34x3½ 36x3½ 36x4 36x4 36x5 36x6	34x4 34x5 36x7 36x7 36x8 36x10 40x6d	W W W W W	Gary	31/2 5 1 11/4-2 21/2 31/2-4 5-6 1	\$2850 3790 4450 2075 3000 3375 4475 5500 1265	414x512 412x6 5 x612 334x514 4 x514 4 x514 412x512 5 x612 376x412	36x4 36x5 36x6 34x5 36x6 36x4 36x5 36x6 33x4 ¹ 2n	36x8 40x5d 40x6d 34x5 38x7n 36x7 36x10 40x14 34x5n	W W W W W W B
Acme. 125 American 25 American 40 American 50 Armleder 20 Armleder 21 Armleder 40-B Armleder 40-C Armleder HW-B Armleder HW-B Armleder HW-B Armleder KW-B	21/3 4 5 1 11/4 11/4 11/4 21/4 21/4 31/4	3350 4275 4500	434x6 4 x6 414x6 414x6 334x514 334x514 414x514 414x514 414x514 414x514	36x6 36x4k 36x5k 36x5 34x3½k 34x3½k 34x3½k 36x4k 36x4k 36x5k	34x6k 34x6k	W W W W W W W	Day-Elder. AS Day-Elder B Day-Elder D Day-Elder C Day-Elder F Day-Elder E Dearborn E Dearborn FX Dearborn FX Dearborn 48	11/2 2 21/2 31/2 5 1 11/2 11/2	1600 2000 2400 2750 3150 4250 1600 2300 2180 2590	334x5 334x5 414x534 414x532 412x532 412x6 334x534 334x534 334x534 334x534	35x5n 34x3½ 36x4 36x4 36x5 36x5k 35x5n 34x4 34x4 34x4	35x5n 34x5 36x7 36x7 36x5d 40x6dk 35x5n 34x5 34x5	W W W W W W W	Graham Bres Gramm-Pion. 10 IGramm-Pion. 05 IGramm-Pion. 05 IGramm-Pion. 30 IGramm-Pion. 75 IGramm-Pion. 50 IGramm-Pion. 50	114-2 114-2 2-21/2 3 31/2 4	1325 1245 1750a 2250a 2475a 3300a 4225a 3850a 4450a	376x41/2 33/2x5 33/4x5 33/4x5 41/4x51/2 41/2x51/2 41/2x51/2 43/4x6	33x4½n 33x5n 36x3½k 36x3½k 36x4k 36x5k 36x6n 36x5 36x6	33x5n 36x5k	W
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Available . H2½ Available . H3½ Available . H3 *Avery . H5 Beck . A Jr. Beck . B-30 Beck . C-40 Beck . D-50	21/2 31/2 5 1 11/4 11/2 2	3160 4175 5375 1285a 1350 1550 1950	4 x5 4 2x5 2 5 x6 3 x4s 3 2x5 334x5 334x5 4 2x5 3	36x4k 36x5 36x6 34x5n	36x8k 40x5d 40x12 34x5n 34x41 36x6 40x8	WWW	Deane	21/2 31/2 6 3/4 1 2-21/2 31/3 1/2 3	4100b 5100b 6000b 730 2490 3400 4400 685a 4000 2775 3500	434x534 434x534 5 x634 374x434 4 x534 434x534 332x5 434x534 434x534 434x534	36x5 36x6 32x4n 33x5n 36x4 36x5 31x4n 36x6 35x5n 36x8	36x7 36x5d 40x6d 32x4n 33x5n 36x7 36x10 34x4n 36x6 38x7n 36x8	CCCBBWWBWWI	Huffman C Huffman D Hurlburt A-A Hurlburt B-B Hurlburt C-C Hurlburt D-D Hurlburt E-E	1½-2 2-3 1-1½ 2-2½ 3-3½ 4-4½ 6-6½	1695 2895 1950 2800 3475 4150 4850	3 ³ 4x5 ¹ / ₂ 4 ¹ 4x5 ¹ / ₂ 3 ³ 4x5 4 ¹ 4x5 ¹ / ₂ 4 ¹ 4x6 4 ³ 4x6 ¹ / ₂ 3 ¹ / ₂ x5	36x3½ 36x4 34x5n 36x4 36x5 36x5 36x6	36x6 36x7 34x5n 36x4d 36x5d 36x6d 40x6d	W W W
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Specifications of Current Motor Truck Models—Continued

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NAME AND MODEL	Tons	Chassits Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bere and Stroke	TIRES Front Rear
Kleiber BR Kleiber B Kleiber C Kleiber C C Kleiber D G C C C C C C C C C C C C C C C C C C	21/2 31/2 5 11/2 21/2 31/2 11/2 21/2 31/2	\$3600 3950 4600 5300 2150 3175 3275 4470 3275 1360 1075 2275 2550 3175	41/8x51/4 41/2x51/2 5 x61/2 31/2x51/4 4 x51/6 4 x51/6 4 x51/6 31/4x51/4 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2	36x4k 36x5k 36x6 34x33 36x4 36x4 36x4 34x5 36x4 34x5 36x4 36x4 36x4 36x4 36x4	36x7k 36x8 36x8 40x12 34x5 36x7 36x7 36x10 36x7 34x41 34x5 36x7 36x7 36x8 40x10 40x6d	W W W W W W W W W W W	Ogden A2 Ogden D Ogden D Ogden D Old Reliable A Old Reliable B Old Reliable B Old Reliable C Old Reliable C Old Reliable C Old Reliable D Old Reliable C Old Reliable D Oneida B9 Oneida D Oneida D Oneida E9 Oneida E9 Oneida B Oshkosh A Oshkosh B	11/2 21/2 31/2 31/2 21/2 21/2 21/2 21/2	\$2350 3500 4250 5000 6000 1095 3200 4050 4725 2485 2485 3485 3585	31/2x5 33/2x5 33/2x5 4 x5 41/2x6 43/2x6 43/2x6 43/2x6 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x5 41/2x6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	34x5n 36x31-2k 36x31-2k 34x4 36x6 36x6 36x6 35x5n 36x4 36x4 36x5 36x6 36x6 36x6 36x6 36x6 36x6 36x6	34x5n 36x5 36x4k 36x6d 36x4d 36x5d 40x7d 35x5n 36x8 36x7 36x8 36x12 36x6n 36x6n 36x6n 38x7n	W W W W W C I W	Selden 70	34 114 112 2 2 3 3 4 6 1 112 2 2 2	\$3750 4950 1330 1600	41 4 x 5 1 2 43 x 4 4 2 33 x 5 5 2 43 x 5 5 2 41 x	36x5
arrabee. X-2 arrabee. U arrabee. J arrabee. K-5 arrabee. K-5 arrabee. L-4 arrabee. W	$1\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $2\frac{1}{2}-3$ $2\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-5$	1925 2400 2400 3100 3450 4000 4800	31/4x41/2 33/4x5 33/4x5 41/6x51/4 41/2x51/2 41/2x51/2 43/4x6	34x5n 34x3½ 34x3½ 36x4 36x4 36x5 36x6	34x5n 34x5 34x5k 36x7 36x8 36x5d 40x6d	W W W W W	Packard EC Packard EX Packard ED Packard EP Packard SP	2-3 2-21/2 31-41 5-71/2	3100 3100 4100 4500 1950	33/ax4 4/ax51/2 4/ax51/2 4/ax51/2 5 x51/2 4 x51/4	36x4 36x6n 36x5 36x6 34x31/2	36x7 40x8n 36x5d 40x6d 34x5	BWWWW	Standard 76 Standard 66 Standard 5-K *Star Sterling 1½ Sterling 2½ Sterling 3½ Sterling 3½ Sterling 5-W	212-3 312-5 5-7 12	2400 3150 4400 610b 2885 3085 3290 4325 4950	418x514 412x512 434x6 318x414 4 x534 4 x534 4 x534 412x614 5 x614	36x4k 36x8 36x5 36x12 36x6 40x14 30x3 40x3 40x3 40x3 40x3 40x3 40x3 40x3
Maccar . L. Maccar . H-A Maccar . H-2 Maccar . G MacDonald . A Mack . AB D.R. Mack . AB Chain Mack . AB D.R. Mack . AB Chain Mack . AC Chain	2345711222223567	5750 3450 3000 3300 33750 3850 34950 5500 5750 6030 3400	41/8x51/4 41/9x51/2 41/9x51/2 41/9x51/2 41/9x5 41/9x5 41/4x5 41/4x5 55 x6 55 x6 55 x6 57 x6	36x4 36x4 36x5 36x5 40x7 36x4k 36x4k 36x4k 36x4k 36x4k 36x5k 36x6 36x6 36x6	36x6 36x5d 36x5d 40x6d 40x14 36x31-x 36x31-x 36x4dk 36x4dk 36x4dk 40x5dk 40x7d 40x7d	WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Paige 54-22 Paige 51-18 Parker C-22 Parker G-22 Parker J-20 Parker M-20 Patriot Revere Patriot Lincoln Patriot LS-800 Patriot Washgt'n Pierce-Arrow Pierce-Arrow	21/2 31/2 1 21/2 31/2 5 1 2 31/2 5 11/2-2 3 3 1/2-2 1/2-2 1/	2420 3145 1875 3200 3950 4850 1380 2050 2175 2900 3200 4350 4850 3000 3800	414x514 414x6 414x6 414x6 414x6 334x51 4 x51 4 x51 4 x51 4 x51 4 42x63 4 42x63 4 444x63 4 444x63 4 444x63 4 444x63 4 444x63 4 444x63 4 444x63 4 444x63 4 444x63 4 444x63	34x4 36x5 34x5 34x4 36x5 36x6 35x5n 34x4 36x5 36x5 36x5 36x5 36x5 36x5 36x5 36x5	34x8 36x5d 34x5d 36x4d 40x5d 40x6d 35x5n 34x6 36x7 36x4d 40x0d 36x6 36x7 40x10	WWWWWWW WWW WWW	Sterling 5-C Sterling 7-2 *Stewart Utility Stewart 1-5 Stewart 7-X Stewart 10-X *Stewart 10-X *Stewa	5 71/2 14-14 11-14 11-2-2 12-3 31-4 11-4 34 11-2 2 3	5500 6000 1245 1790 2390 11245 1095 1790 2150 2490 3150 2800 3750	5 x614 5 x614 33\x51\x5 33\x51\x5 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x51\x51 41\x	30x6 40x6d 30x6 40x7d 30x6 40x7d 30x6 40x7d 35x5n 35x5n 35x5n 35x5n 31x33½ 34x6 33x4 34x8 30x5 30x10 34x4½ 34x4½ 34x4½ 34x4½ 34x4½ 34x4½ 36x7 34x5n 34x5n 34x5n 34x5n 30x3 36x5 30x4 30x7 30x5d 30x5 30x5d 30x5d
Mack Trac. AC Mack Trac. AC Mack Trac. AC Mack Trac. AC Mapleleaf "" Mapleleaf BB** Mapleleaf BB** Mapleleaf DD** Mason Master JD Master JU Master JU Master JD Master JD Master BB** Mapleleaf DB** Mason Master JD Mas	70 13 15 12 2 3 4 5 1 1 1 2 2 3 3 2 2 3 3 1 5 1 1 1 2 3 3 1 2 3 1 1 1 1 1 1 1 1 1 1 1	4950 5550 5750 6000 3600 4050 4800 5625 1200 2290 2290 2290 2290 2290 4900 3190 4990 4990 3390 4490 4900 3390 4290 2200 2000 2000	14 4 x 5 5 x 6 5 x 6 5 x 6 5 x 6 5 x 6 5 x 6 5 x 6 5 x 6 5 x 6 3 4 x 5 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	36x5 36x6 36x6 36x4 36x4 36x5 36x5 34x50 34x3 34x3 34x3 36x5 36x5 36x5 36x5 36x5 36x5 36x5 36	36x5 36x8 36x10 40x12 36x6n 34x5n	CCCCWWWWWWBBWDDWWWDDDDWWWWWWWWWWWWWWWWW	*Rainier R-2: Rainier R-2: Rainier R-2: Rainier R-2: Rainier R-1: Rainier R-1: Rainier R-1: Rainier R-1: Rainier R-1: Rainier R-1: Rainier R-2: Ranger TK-20- *Reo J- **Reo J-	34 11/2 11	1450 1185 2400 3100 1395b 1395 1695 1795 2195 3095	31/2x5 33/2x5 33/2x5 33/2x5 33/2x5 11/2x5/3/2 11/2x5/3/	36x3 ¹ / ₂ 36x4 32x4 ¹ / ₂ 34x3 34x5n 34x4 36x4 36x5 36x6n 34x4 34x5 38x7n 36x5 36x6	36x4d	W W W W W W W W W W W W W W W W W W W	Transport 75 Traylor B Traylor C Traylor D Traylor I *Triangle A Triangle A Triangle G Triangle G	31/2 11/2 2 3 1 11/2 2 3 31/2 5 5 6 1 11/2 2 2-21/3 3-31/2 2-21/3 2	1795 2100 2700 3600a 4300 4500 2750 36030 4100 2000 2475 3475 1595a 1595	4 x514 415x514 415x512 415x514 415x6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	34x5 34x5 36x5 36x5 36x5 40x5d 36x6 40x6d 36x6 40x6d 36x6 40x12 36x4k 36x5k 36x5k 36x5k 36x5k 36x5k 36x5 35x5n 35x5n 35x5n 35x5n 35x5n 35x5n 36x4 36x3 36x6 36x4 36x3 36x6 36x4 36x3 36x6 36x4 36x5k 36x4k 36x4k 36x4k 36x4k 36x4k 36x4k 36x4k 36x4k 36x4k 36x6 40x6d 34x313k 36x7k 36x6 40x8 36x7k 36x4 40x8 36x7k 36x4 40x8 36x7k 36x5 40x5d 36x7k 36x5d 40x5d 36x5d 40x5d 36x7k 36x5d 40x5d 36x7k 36x5d 40x5d 36x7k 36x5d 40x5d 40
Moreland. AX Moreland. RX Mash. 2018 Nash. 3018 Nash. Quad Nash. 3018, LWE Nash. Soll Nash. 5018 Nash. 5018 Nelson. GC Nelson. GC Nelson. GR Netco. DK Netco. DK Noble. A2 Noble. B3 Noble. D5 Noble. D5 Noble. D5 Noble. E7	8 1-11 8 2-21 1 2-21 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1595 2 2150 2 2200 2 2200 2 2800 2 250 3100 3500 3500 3000 1750 2 2395 3 2495	43 4 5 5 4 4 4 5 5 4 4 4 5 5 4 4 4 5 5 4 4 4 5 5 4 4 5 5 5 4 4 5 5 5 4 4 5 5 5 4 5 5 5 6 5 6	34x4 34x4k 36x6 34x4k 36x6 34x4k 36x5 36x4 36x4k 36x4k 34x5 36x4 36x4 34x5 36x4 36x4 36x5	36x7 36x5d 40x6d 36x7k 36x8k 36x7k 34x5 36x7 36x8 36x10	W W W W W W W W W W W W W W W W W W W	Sanferd. W-1 Sanferd. 2 Sanferd. 3 Sanferd. 5 Schacht. 2-Te Schacht. 3-Te Schacht. 5-Te Schacht. 5-Te Schacht. 7-Te Schacht. 7-Te Schwartz.	n 3 n 4 n 5 n 7 A 1 K 2 L 3 0 1½-2 1 1½-2 0 2½-3 1 2½-3	3200 3800 4400 4600 5050 1685 3000 3600 49 2250 3350 4350	41/4x5/4 4/4x5/2 41/4x5/2 41/4x5/2 41/4x5/2 41/2x6 31/4x5/2 41/2x5/2 41/4x5/2 41/4x5/2 41/4x5/2 41/4x5/2 41/4x5/2	36x5 36x5 36x5 36x6 34x4 36x4 36x4 36x4 36x6 36x4 36x6 36x6	36x8 40x12 34x5 38x7n 36x7 40x8n	W W	Twin City	3 5 2 2 2 2 3 3 3 5 1 1 2 3 3 4 3 5 1 1 2 3 3 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	3150 3200 3250 3750 3800 5500 895 1445 1595 1795 1795 2275 3975 1800 2275 2275 3300 4075	5) 6x6 5) 6x6 4 x5) 6x6 4 4 x5) 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	36x8 36x6 36x7 36x7 36x7 36x7 36x7 36x7 36x3 2 36x6 36x4 36x4 36x6 40x12 34x5n 34x5n 34x5n 34x5n 36x5 36x5 36x5 36x5 36x5 36x5 36x5 36x5
Noble B3 Noble C4 Noble D5 Noble E7 Northwestern W Northwestern W	0 2 0 216 0 316 V 116	****	3%x5\4 4 x5\4 4\4x5\4 4\2x6 4\8x5\4 4\2x5\4	36x4 36x4 36x5 34x4	36x5 36x7 36x8 36x10 36x6 36x8	A A A A A A A A A A A A A A A A A A A	tion, I—Interna r—8 cyl. s—6 c k—pneumatic t a—price include	d Gear, yl. t— ires opi s sever	W—Wor 2 cyl.—al tional at al items of	rm. I others ar extra cost. f equipmen	e 4 cyl. o	d—dual ti eumatic ti price inclu	res. res.		6 11/2 3 21/2	1585 2185 2699	334x5 4 x51/8 334x514	36x3½k 36x5k 36x4k 36x7k 35x5n 35x5n

Specifications of Current Motor Truck Models-Continued

NAME AND MODEL	Tens	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tous	Chassis Price	Bere and Streke	Front	Rear	Final Drive	NAME AND MODEL	Tens	Chassis Price	Bere and Struke	Front	Rear	Final Drive
Walker-JohnsonB Walter M Walter S *Watson C	3 4 1/2 3/4 2 3 21/2 5 1 1/2 21/2 21/2 21/2	\$3899 4200 5395 995 2500 3000 3850 4850 1465a 4250 2450 2450 3250 2450 2400	414x514 414x514 415x6 415x5 414x514 415x614 354x514 354x514 415x614 414x514 414x6 414x6 414x6 334x516 334x516	36x4 36x4 36x5 32x4n 36x4 36x4 36x6 35x5n 36x3 36x3 36x3 36x3 36x3 36x4 36x4 36x4		W W W B W W W W W W W W W W W W	White 20 White 40 White 45 Wichita K Wichita K Wichita RX Wichita RX Wichita O FINAL DRIVE tion, I—Internal r—8 cyl. s—6 cyl k—pneumatic tira a—price includes body. 4—expre Make, trac.—tra	3½ 5 1 2 3 4 Gear, ' t-2 es opti	W—Worn cyl.—all onal at e litems of	others are xtra cost.	4 cyl. d n—pne	36x8k 36x5k able Red	res. res. des	Wilson	11/2 21/2 31/2 5 11/2 21/2 5 1 11/2 21/2	\$1900 2550 3000 3950 4350 2270 2825 3685 4520 1750 2100 3000 3500 4000 2450 2900	334x514 414x5 414x5 414x6 434x614 334x5 414x514 414x514 434x6 334x5 334x5 414x534 414x534 414x534 414x534	36x4k 36x4 36x4k 36x5k 36x5 36x3 36x4 36x6 34x5n 35x6 36x6n 36x6n 36x6 36x6 36x6 36x6 36x6	36x4k 36x5 36x5-36k 40x6d 36x5-36x7 36x7 36x6 34x5n 40x6 36x10 36x12 36x12 36x16 36x18 36x18	W W W W W W W W W W W W W W W W W W W

Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bere, Strake	Fuel	Plaw	TRADE NAME	Rating	Price	Wheels or Crawlers		Cylinders; Bore, Streke	Fuel	Plow	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bere, Stroke	Fuel	Plow
Allis-Chal.G.P. Allis-Chalm Allis-Chalm Allwork2-G	6-12 15-25 20-35 14-28	\$295 1185 1885 1595	4	LeR. Midw. Own Own	4-31/6x41/2 4-41/6x51/4 4-43/4x61/2 4-43/4x6	Gas.	1 3 3–4 3	Gray	18-36	1975	3	Wauk.	4-43 ₄ x63 ₄	Gas.	4	OilPullE ¶OldsmarK	30-60 2½-5			Own Own	2-10x12 1-5½x5½	K,D Gas.	8-10
AllworkC JARO.1921-22 Aultman-T, Aultman-T, Aultman-T, Avery,SR,Cul	14-28 3-6 15-30 22-45 30-60 5-10	1293	4 4 4 4 4 4	Own Own Clim. Own Own Own	4-5 x6 1-41/2x5 4-5 x61/2 4-51/2x8 4-7 x9 4-3 x4	GorK Gas. G,K,D G,K,D G,K,D G,K	3 1 4 6 8-10	Hart-Parr 20 Hart-Parr 30 : Hart-Parr Heider	20 30 9-16 12-20	628		Own Own Own Wauk. Wauk.	6½x7 4-4¼x5¾ 4-4½x6¾	K,D. K,D. G,K G,K.	2 3	PioneerG PioneerC	18-36 40-75			Own Own	4-5½x6 4-7 x8	G,K,D Gas.	4 10
Avery Cult-C Avery C §Avery Avery Avery Avery	12-25 14-28 9 6 25-50		3 4 4 4 4 4	Own Own Own Own Own Own	6-3 x4 6-3 x4 4-4x5½ 2-6½x7 4-45½x7 4-5½x6 4-6½x7	G,K G,K,D G,K,D G,K,D G,K,D G,K,D	2-3 3-4 4-5	Huber Light, 4 Huber Super 4	5-10 12-25 15-30		4 4	Wauk. Midw.	4-31/4x41/2 4-41/4x53/4 4-41/4x6	Gork Gas.	3 3	Russell Russell Russell Russell	12-24 15-30 20-35 30-60		4 4	Own Own Own Own	4-41/4x53/4 4-5x61/2 4-51/2x7 4-8 x10	Gor K Gor K	2-1 3-4-1 8-10
Avery	45-65		4	Own	4-734x8	G,K,D		International International International	8-16 10-20 15-30	****	4 4 4	Own Own Own	4-414x5 2-612x8 4-514x8	G,K,D G,K,D G,K,D	3	Shaw-Enochs			2	LeRoi	4-31/6x41/6	G-sa.	
Bates All-StID Bates Mule. H Bates Mule. F BatesMule. G	15-25 18-25 25-35	****	*2 *2	Own Midw. Midw. Midw.	4-41/4x6 4-41/6x51/4 4-41/6x51/4 4-41/2x6	Gas.	3 3 3	¶Kinkade	134-3	190	1	Own	1-3 x3	Gas.		(Grader)							
Bear. Beeman Jr Beeman G Best 39 Best 60 Bolens. Bryan.	18-30	180	*2 *2 4	Ste. B&S Own Own Own B&S Own	4-43/x61; 1-21/x21; 1-31/x41; 4-43/x61; 4-61/x81; 1-21/x21; 2-4 x5	Gas. Gas. G,K,D G,K,D	**	La Crosse La Crosse Lausen5 Lausen21 LeaderB LeaderN	12-13 16-32	1295 1675		Own Own Midw. Beav. Own Clim.	2-4 x6 2-6 x7 4-43/x53/4 4-43/x6 2-6 x61/4 4-5 x6	Gork G,K,D G,K.	3-4	ToroTractor'22 Townsend Townsend Townsend Traylor Traylor Twin City Twin City	6-10 10-20 15-30 25-50 6-12 12-20 20-35 40-65	800 1350 2500 500	2 2 4 4 4	LeR. Own Own Own LeR. Own Own	4-7 x8 4-8½x10 4-3½x4½ 4-4¼x6 4-5½x6¾	Ker. Ker. Ker. Gas. H,K	2 2-3 3-4 4-8 1-2 3 5-6 8-10
Case	12-30 15-27 22-40 40-72 25 40 5-2½	1490 2650	4 4 4 *2 *2 *2 2	Own Own Own Own Own Own Own Own N Way	4-41/4x5 4-41/4x6 4-51/4x63/4 7 x8 4-43/4x6 4-61/4x7 2-21/4x5	G,K,D Gas. Gas. GorK	3-4 4-5 8-10 4 6		18-35 15-30 16-22 26-35 100			Buda Own Own	4-5 x6 4-41/2x6 4-41/2x5 4-51/2x6 6-53/4x7	G,K G,K K K Gas.	3-4 3 4 6 16	Uncle SamC20 Uncle SamB19 Uncle SamD21 Utiliter501 Utiliter501A	20-30 20-30	1985 1985 295	4 4	Weid. Beav. Beav. Own		GorK GorK	2-3 3-3 1 1
CletracF CletracW Do-It-AllA Do-It-AllA Do-It-All6	3-6		5	Own Own	1-41/2x5 1-35/8x37/2-35/8x37/	Gas.	2 2-3	MerryGar1922 MinneAll-P MinneGen.P Minne. Med.D MinneHeavyD Moline Univ D Meline Orch	2 12-25 17-30 22-44 35-70 9-18 9-18 20-30	650	4 4 4	Own Own Own Own Own Own	1-256x2½ 4-4½x7 4-4¾x7 4-6 x7 4-7¼x9 4-3½x5 4-3½x5 4-3½x5	Gas. Gork Gork Gork Gork Gas. Gas. G,K,D	3 3-4 5-6 8-9 2-3 2-3 4	WallisK WaterleeN Wetmere21-22 WiscensinE WiscensinH	12-25 12-25 16-30	1185 1750	4 4	Own Own Wauk. Clim. Clim.	4-4 x534 4-5 x612	Ker. G,K	3 3 3 4-(
Eagle F Eagle H E-B AA E-B Q E-B	16-30		4 4	Own Own Own	2-7 x8 2-8 x8 4-434x5 4-434x5 4-514x7	Gork Gork G,K,D G,K,D	3	NB. 1 Nichols-Shop. Nichols-Shop Nichols-Shop	3-6 20-42 25-50 35-70	3000	4	Own Own	2-334x4 2-8 x10 2-9 x12 2-1014x14	Gork	1 3-6 4-8 8-12		15-25 25-40	2750 4250	*2 *2	Wise. Wise.	4-41/4x6 4-53/4x7	G,K,D G,K,D	
Fageol D Fordson Frick A	9-18 -18 12-20	39	5 4	Lye. Own Erd.	4-31/2x5 4-4 x5 4-4 x6 4-43/x6	Gas. G,K G,K G,K	2 2 2-3 3 4	OilPullK	12-20 16-30		4	Own Own	2-6 x8	K,D K,D	3 4 5-6	ABBREVI Distillate. P tions. Figure —Beaver. B —Continenta Hercules. I Way. Nor	low caps are bat S—I. Do eR.—L.—North	secity seed or Briggs m.—D eRoy. way.	varies a 24 i & St lomas Mi Ste Wisco	s in rela n. plows ratton. Evin dw.—M —Stearn onsin.	Clim.—Clim.—Clim.—Evinrude lidwest. N s. Wauk.— *—Crawler	ating ed ake: B max. C e. Her way.— Wauke type.	Beav. Cont. rc.— New esha.

Specifications of Current Passenger Car Models

		PRIC	CES			Base			F-19	Horse	· ·	la la	pur		Type		- = T	9.0	1 to
2-Pass.	5-Pass.	7-Pass.	Sport	Coupe	Sedan	Wheel B	Tires	Engine Make	Cylinder Bere and Stroke	Rated Horr Power (N.A.C.C.)	NAME AND MODEL	Carbure	Starting	Ignition	Clutch: Ty	Gearset	Universi Type an Make	Rear Ax Type an	*Genr R.
995c 1	\$1785 1650	\$1850	₹1885e	/	\$2485	127 127	33x4½ 33x4	H-S Own	6-31/2x5 2-	29.40	AmericanD-66 AmericanSteamer	None	G-D	1-K L-N	None	B&B None		. Own.	n. 1 %
	1195				{1450d 1595d	114	32x4	Cont	6-31/8x41/4		Anderson41	Zenith	. West	West	s-р В&В	Durston.	. f Universal.	. 12F Salis.	S. 4.0
495	1495	1595	{1785b 1915c		1995d	120		Cont	6-33/8x41/2		AndersonSeries 50	1	-			Durston.	. f Universal.	F Salis.	4.0
	1535 2800	2930	(19130		∫3850f		32x41/2 34x41/2	Own.	6-31/8x41/2 8-31/4x5	23.44 33.80	Apperson6 Apperson8-21-S	Strom Johnson.		Remy	m-d Own	Own	m Sterling	. 39F Own.	a. 47
	1275		1895c		13750d			Cont	6-33/sx43/s							G-L	m Universal		1.00
	1095		11995в			114	31x4	Cont	6-31/8x41/4	23.44	Auburn6-43	Strom	Remy	Remy	в−р В&В	Warner.		1/2F Col	
65	1395 885	725g	1495d		1850d (1395	122 118 109		Cont . Own	6-31/4x5 6-31/8x41/4 4-33/8x43/4	25.35	Barley	Strom	. Delco	Delco	. №р В&В	. Fuller	. f M&E	1/2F Col 1/2F Col 3/4F Own.	
	1195	975g 1435	(1625a	1935 1895	1985 1985 2195	118 124	33x4½	Own	6-336x43/2 6-33/6x43/2	27.34	Buick 1923-41-4-5-47 Buick . 1923 48-9-50-4-55		Delco	Delco Delco	m-d Own m-d Own	Own	m Own m Own		121124
85	2885	2885	\1675c		3950	132	33x5	Own	8-31/sx51/s	31.25	Cadillac61	Own,	Delco	Deleo	m-d Own	Own	m Spicer	. F Tim.,	
50b	1790	1000	2230d 1950c	2480	2575	122 129		Cont	6-33/8x41/2 6-35/8x51/4	27,34 31.54	CaseW	Rayfield	Deleo	Delco	. m-d Own	. Own	. f Arvac		
5	1185	1990		2483c 1595	2975b 1585d		31x41/2 32x4 32x4	Own	6-31/4x41/2 6-31/4x41/2	25.35	Chalmers	Strom	A-L	Remy	m-d Own	. Own	. m Hardy	. 16F Adam	ams 5
				1695d		1 123		Own	6-31/4x4/2 6-31/2x5	29.40		Rayfield.	I. Bosch	Bosch	s-p B&B		. f Own		
0	1695c 525	425g]	840c		103	30x312	Own.	4-3 1x4	21.76	Chevrelet, Superior	Holley .						. 1/2F Own.	43
0	725	625g		1040c 880k	1060	[163	30x3½	2 Own	4-3½x3½	19.60	ChevroletM	Carter.		Remy	m-d Own	Own	m Mech	1/2F Own.	n. 4
15b 15	995	1885	1260d 1885e	(2585b)	1485d 2685f		31x4 33x5	Own. Nort.	6-3 1 x41/2 8-3 2x41/2	22.50 2 39.20		Strom Johnson.		. Delco	m-d North	Own	m Mech m Spicer	1/2F Own. 3/4F Col.,	
5	1475		1395d	12685d 1995c 1235a	1995d		32x4 31x4	Cont	6-336x41/2 6-31/6x41/4	27.34 23.44		Strom Strom		A-K	s-p B&B s-p B&B	Durston Durston	m Spicer		
5	1235		/1195b	(2055d	2055d		32x4	Falls.	6-31/8x41/4			Strom	. West	. A-K	е-р В&В	. Muncie.		. 34F Col	5
		3000		1875‡	4500	138	33x4½ 33x5	Cont	6-35/8x51/4 6-35/8x51/4	31.54 31.54		Zenith Zenith					m Spicer	. 1/2F Tim.	Accel
1	12500	1980	3500c		4250c	142	33x5	Own	. 8-33/4x5	45.00	CunninghamV	Strom	Delco	Delco	m-d Own	Own	f Snead m Spicer	F Tim.	Acre
i3b i3b	1 95	4350	435 c 1495 c 1695				33x5 31x4 32x4	Own Cont	8-31/2x51/4 6-31/5x41/4 6-35/4x41/6	23.44	Davis	Strom	Delco	Delco	8-p B&B	. Warner.	m Spicer m Peters m Peters	12F Tim.	m.,.
5	1595 880		1695	2095 980h			32x4 32x4	Cont Own	6-3%x41/2 4-378x41/2		Dedge Brothers	Stewart.	N.E	. N.E	m-d Own	. Own	m Own	32F Own	vn
15	3950e 865	3950	4150e /1015a	11240	/1370	f 132 108	33x5 31x4	Own D-Ly.	6-4 x5 4-31/2x5	38,40 19,60				Bosch	m-d Own m-d Detlaff	Warner.	m Spicer m Mech	12F Tim.	
00	990		[1015]	11020k 11145 11365	1070k 1195 1495	115	31x4	Falls	6-31/8x41/4						1			1	
50	5500 890	5900	5750 1095e	7250c 1365	7500d 1365	1 134 109	33x5 31x4	Own Cont	8-27/sx5 4-37/sx41/4	26.45 24.03		Strom		. A-L	. s-p Own	. Warner.	f Climax	%F Adat	
00 85	1650 1095			1465‡ 2250 1795e	2100		32x434	Anst	6-31/4x41/2 4-3/4x51/4	4 18.91	Earl40	Scoe	d. A-L	A-L	s-p Ansted	. Own	r m,f Spicer f Own	14F Own	WII.
95	965 1395	*****	1165d		. 1425d 2065	1 112	31x4	Lyc Cont	4-31/2x5 6-31/4x41/6	19.60	Elcar4-40	Strom	Delco	Delco	.lm-d Warner	. Muncie. Warner	m Peters	34F Salis	lis.
	1015			1975 1145 1895c	1245k	k 10819	16 32x4		4-33/4x5 6-33/4x5	18.23 27.34	Essez	Own	. Bosch	. Bosch	m-d Own	Own Warner.	m Spicer	34FAdan	ams.
59 r	1195c 298s		ğ	1895c 530		100		Own	. 4-33/4x4	22.50	FordT	Own	Own	. Own	m-d Own	Own	m Own		B.
00	2975 1950			4900 2750e	4900d	d 132		Own	6-33/8x5 6-31/4x4	27.34 25.35	Franklin	Own	N.E	. A-K	m-d B-L n-p B&B	Own	m Spicer	12F Tim	
85 90	965 490		1065c		k 1365d b / 785d	d 112 d 100	32x4			21.76 21.03	GardnerT-R & G	Carter.	West	. West	s-p B&B m-d Own	Mech	m Mech	%F Flint	int.
50	2250e 2650				835d	d 120 126	32x434 32x434	Weid.	6-31/2x5	29.40	H. C. SSeries 6	Stromb.	. Deleo	. Delco	m-d B-L m-d B-L	B-L	m Spicer	34F Own	wn.
50	2000	2150	1350d			115	32x41/32x41/	Falls.	6-31/8x41/4 6-33/8x5	23.44 27.34	Handley6-40	Strom	Bosch		m-d Mech m-d s-p B&B	Mech	m	Tim	im.
95	1595 1345	1345e	. 1695e	. 1950	1950	d 121 115	32x4 32 4	Cont H-S	6-33/8x41/2 4-31/2x5	2 27.31 19.60	Hansen	Marvel. Zenith.	Deleo Dynety	. Conn	8-p B&B	G-L	m Universal m Spicer	%F Col.	01
95	4 mm F	1795 c /2395	1975d	1 2175 (3095	2275 33951	121	32x4	H-8	6-314x5 6-358x518	25.35	5 Hatfield55	Stromb.	Bosch	. Bosch	е-р В&В	B-L	m Spicer m Universal.	. F Col.	ol
45	1595	2550p		3250p 2395p	p (2595	121		34 Own	. 6-31/2×5	29,40							m Universal		
95p	1850p 2500e	e 2500		. 3300c	2695p 3600f	126	34x41	1/2 Own	6-31/2×41/4	29.40	HolmesSeries 4	Strom	Dyneto	Eisemann.	m-d B-L	B-L	m Peters m Spicer	1/2F Tim	im
	. 1425e	e 1475	(1018	. 2570c	e 1525k 2095	k 126		Own	6-3½x5 4-3¼x5½	29.40			Bosch				m Spicer m Universal	1	
115 9 5 b	995		1215d	d \1535e d 1445e	e 1465d	d 112	31x4	Own	. 6-31/4x5	25.1.5	5 JewettSix	Strom	Remy		m-d Long	Warner	r m Mech	1/2F Tim	im
395	1795			. 2485c	e 2485d	d 120 1243	32x4 32x4	Own	. 6-314x434 6-314x434	26.34 26.34	Jordan	Strom.	Delco	Delco	m-d Detroit.	Detroit	t. m Spicer	1/2F Tim	im
595	1150	1595e	c 1895e	e 2200c	1450 c 1995	111 120	32x4 32x41	Gray	. 4-312x5 8-3 x5	19.60 28.80	0 Kelsey	Scoe Ball&B	. Bosch West	Bosch A-K	s-p B&b	Detroit Own.,	t. m Spicer f Universal	L. F Col	ol.
795	. 1795 . 1485	1795e	e 1995 e . 1685d	c 2500 d 2585‡	2625 2285d	124 id 121	32x41 32x4	1/2 Own	. 8-3 x5 6-3-4 x51/s	28.80 26.34	0 KingL 4 Kissel	Strom	Remy	Remy	m-d	1	m Spicer	JAF Tin	im.
985	. 1885 4090e	e 4090	2385e	e 2975e 5500e	le 3075 le 5500f	124 of 132	32x41 33x5	Own	. 6-3 4x514	26.38 33.80	8 Kissel	Strom	n. Delco	Remy Delco	m-d Warner m-d Own	. Warner	er m Spicer m Own	F Own	WII.
795		(1795	2045d [2145d	d (2415c d (2745‡	ie [2215d 1 12645d	d 123	32x45	1/2 Anst.	6-314x41/	25.35	5 Lexington23	Raybeid	1. G-D	. Conn	m-d Own	Warner	r. f Snead	%F San	is.
1575	1	1	1795	12085	2245		32x4	Own	6-31/8×5	23,44	4 Liberty10-D	Strom.	Wagner.	Wagner,	в-р В&В	Detroit	it m Spicer	1/21 Tin	m.
3800		e 3800		\1695k	6k 649006	136			8-3%x5	36.45	5 Lincoln	1					m Spicer		
0000	1				114700d	-41				48.60	0 Lacomobile Series 8			ni	100	0	m Own	F Own	

MISCELLANEOUS

- MISCELLANEOUS
 a=2 Passenger,
 b=3 Passenger,
 c=4 Passenger,
 c=4 Passenger,
 c=Chassis Price,
 h=All Metal Type,
 k=Soft Top Type,
 n=Tire Size 3224%,
 p=Sport.
 r=Price without starter and demountable rims. Price, complete, \$364,
 s=Price without starter and demountable rims. Price, complete, \$393,
 tRiandard Phaetons.
 t=Brougham

ENGINE

ENGINES
Anste-Ansted
Cont-Continental
D. Ly-Dort Lycoming
H.S-Herschell-Spillman
Lyc-Lycoming
Nort-Northway
Walk'r-Walker
Weld-Weldely

CLUTCH
c—Cone
m-d—Multiple disc
s-p—Single plate
B & B—Borg & Beck
B-L—Brown-Lipe
North—Northway

CARBURETOR
Ball & B—Ball & Ball
Till—Tillotson
Strom—Stromberg
Y & T—Yale & Towne

(Continued on page 54)

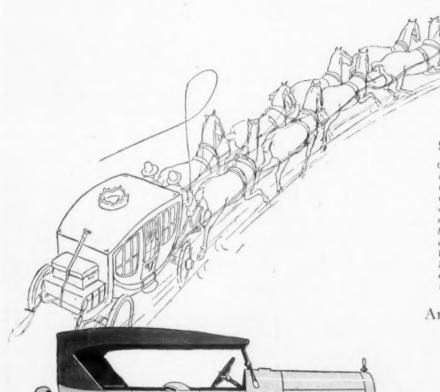
STARTING, LIGHTING
IGNITION
A-L—Auto Lite
G-D—Gray & Davis
L-N—Lebce Neville
N. E.—North East
West—Westinghouse

GEARSET
B-L—Brown-Lipe
G-L—Grant-Lees
Mech—Mechanics
North—Northway

UNIVERSAL, (—fabric m—metal M&E—Merchant & Evans Mech—Mechanics

REAR AXLE
F—Floating
1/4F—Semi-Floating
7/4F—Tree-Quarter
Col—Columbia
Salis—Salisbury
Tim—Timken

Unmatched Value



SPECIFICATIONS

Coachbilt Anderson Aluminum
Body; Six Cylinder, Red Seal Continental Motor; Westinghouse Starting, Lighting and Ignition; Borg
and Beck Clutch; Cord Tires; Alemite Lubrication; Motometer; Snubbers; Wind Shield Cleaner; patented Foot Dimmer for Headlights;
Wheelbase 115 inches. Average 19
Miles per gallon of gas—and a direct with factory contract at maximum discount.

Anderson Motor Company Rock Hill, South Carolina



ANDERSON

ALUMINUM SIX

only

\$1195

f. o. b. Rock Hill, S. C.

Specifications of Current Passenger Car Models

1		PRIC	CES			Base			Ë	Horse		ter	and		Type		ä	# P	100
2-Pass.	5-Pasts.	7-Pass.	Sport	Coupe	Sedan	Wheel B	Tires	Engine Make	Cylinders Bore and Strake	Pewer (N.A.C.	NAME AND MODEL	Carbureter	Starting	Ignition	Clutch: Type and Make	Gearset	Universal Type and Make	Rear Axle Type and Make	ACCOUNT D
185a 1435c	3435e \$	\$3185	\$33 85 a		{4385 f 4385 c	136	32x436	Own	6-33/4x51/8	33.75	Marmon34	Strom	Delco	Delco	m-d Own	Own	m Spicer	34F Own	3.
900	925			985	1335 1635‡	109		Own	4-35/4x43/2	21.03	Maxwell	Stewart.	Remy	Remy			f Own	14F Own	1
400				6720 9000f	6720e 6810f	140		Own	6-4½x6	48.60	McFarlan1923		West	1		B-L	m Peters	F Tim.	. 3.
	3950c 3750e	3950e	3750c		5250e	132 132	32x41/2 32x41/2	Own	4-334x634 6-334x5	22.50 33.75	Mercer Series 5 Mercer 6		West	Eisemann Eisemann	m-d Own m-d Own	Own	m Spicer m Spicer	F Own	3.
	1895 1590		1850c		2275d	120	32x4	Cont	6-31/4x41/2 6-31/4x5	25.35 29.40	MeritF-50	Strom Strom	Remy	Delco Remy	а-р В&В а-р В&В	Own	f Snead m Own	F Col.	4.
		1690	1445d		1695	127	32x41/2		6-3½x5 6-3½x4¼	29.40 23.44	Mitchell F-50 Moon 6-40	Strom	Remy	Remy	8-р В&В	Own	m Own m Spicer	F Own.	4 4
1	1785		1995	2585е	1895p 2485 f 2685 f		33x4½		6-336x436	27.34	Meen, 6-58			Deleo	а-р В&В	B-L	m Spicer	34F Tim,	100
			1645c		2040d 2190f	127	34x41/2	Own	6-314x5 6-314x5	25.35 25.35	Nash691-3-6-7 Nash692-4-5	Marvel	Delco	Delco	»-р В&В	Own	m Own	14F Own.	4
15	935			(1385b) (1195k)	(1545d) (1275k)	112	33x4	Own	6-31/4x5 4-33/4x5	18.23	Nash41-4	Schebler.	Delco	Deico	s-р В&В	Own	m Own	1/4F Own,	-
		3150		(3250e 3725e	3285 f	-	32x4½		6-31/4x51/4	29.40	National 6-71							F Col.	4
	1485 . 795 .			1785d	1095d	112		Cont	6-38/8×41/2	27:34	National6-51 National6-31	Stromb.			s-p B&B	Covert	m Universal		4
75 15p	2500c 995	2600c . 795g	1165 e	(1445d 1185a		128 115		Cont	6-3%x41/2 6-214x43/4	27.33 18.99	Noma	Zenith Marvel	Delco Remy	Delco Remy	e Own	Detroit Muncie	m Spicer m Mech	F Own.	-
55				/1475 (1195a				Own	4-314x514	21.86	Oldsmobile43 A			Remy	s-р В&В	Muncie .	m Own	34F Own.	
25	1375 .	1735	1675e	1875b	2025d		32x4	Own	8-276x434 8-276x434	26.45 26.45	Oldsmobile		Delco	Deleo	e Own *-p B&B		m Spicer m Own	F Own.	
25 35	525 2485		425g 2650e	795 (3175e)	860d (3275d	100		Own	4-3 ³ / ₈ x4 6-3 ³ / ₈ x5	18.23 27.34	Overland	Till	A-I	Conn	a-p B&B m-d Own		m Own m Spicer	12F Own.	
	2350g	2685		(3350d)	3525f	133	33x43/2	Own	6-33/sx5	27.34	Packard133	Own			m-d Own	Own	m Spicer	1/2F Own.	
50	3850c	3850			\3575 f \5100 f \5275 f	136	35x5	Own	12-3x 5	43,20	Packard335	Own	Bijur	Deleo	m-d Own	Own	m Spicer	32F Own.	
				13135	3235d 3235f	131	33x4½		6-3¾x5	33.75	Paige6-70	Rayfield.		A-K	m-d Long	Warner	m Mech	1/2F Tim	
50		1425 2990		2395 ∫3400a	2395 /3990d			Cont Own	6-33/8x41/2 8-31/4x5	27.34 33.80	Patersen 22-6-52 Peerless 23	Strom Ball&B	Delco	Delco	s-p B&B m-d Own		m Hartford m Spicer	12F Eaton	1.
	5250c	2020		(3550c 6800	409 f 6900c			Own	6-4 x5½	38.40	Pierce-Arrow	Own	Delco	Delco	m-d Own	Own	m Spicer	12F Own.	
75	1695 595		1745	2445 895			32x41/2 32x31/2	H-S	6-314x5 4-3x414	25.35 14.40	Pilet 6-50 Premier Strattan	Till	Bijur	Conn	s-p B&B	Muncie.		34F Col.	
50		3250 .		4300 1750	5100	12634	32x41/2	Own	6-33/x51/2 6-31/x41/	27.34	Premier Strattan Premier 6-D Premocar 6-40-A	Zenith Johnson Strom	Delco	Delco	в-р В-В	Covert Own Mech	m Spicer m Spicer	3/4F	
85b		2485		3350	3550f	128	32x44	Anst.	6-33/8x51/4 6-33/8x51/4	27.34 27.34	Princeton	Rayfield.	A-L	A-L	m-d Durant		m Spicer m Spicer	1/2F Dur	
	1665 2850	2000		2385e	2175d (3500d	116		Own	4-334x5 6-316x416	22.50	R & V Knight R R & V Knight H	Strom	Wagner	Wagner	3-p B&B	B-L B-L	m Spicer	F Salis.	
			1745	(1835c	3700 f			Own	6-34x5	24.34	ReoT6			N.E	m-d Own	Own	m,f Own	1/2F Own.	1
85			2750e 3650e	\2185‡ 1885¢ 3585	3585d			Own Cont Roch	6-31/x43/4 6-31/x51/4 4-41/4x6	23.44 29.40 28.90	Rickenbacker A Roamer 6-51-E Roamer 4-75-E	Strom Strom Strom	Simms West West	A-K Splitdorf Splitdorf		Warner G-L B-L	m Universal f Snead f Snead	34 F Col 1/2 F Tim 1/2 F Tim	
85	0900	10950			{13150 12900	1433/9	35x5	Own	6-43/2143/4	48.60	Rolls-Royce40-50	Own	Bijur	Bosch	e Own	Own	m Own	F Own.	
				5100e 5250e	5200e 5250			Own	4-23/4×51/4	12.10	Rubay	Stromb	Bosen	Bosch	э-р Оwn	Own	m Universal	F Own.	
75	1645 875				2645	108	30+314	Cont Lyc	6-336x41/2 4-31/2x5	19.60	SenecaL-2 & O-2	Zenith	A-L	A-L	»-р В&В		m Arvae m Universal	F Peru	
85 50	985	2395	2395			112 · 127	31x4 34x436 32x436	Own	4-31/2x5 8-31/4x5	19.60 33.80	Seneca50 & 51 Standard98	Zenith Zenith	A-L West	A-L Splitdorf	а-р В&В а-р В&В	G-L	m Universal. m Arvac	F Peru.	
50 19r	2750 348s	2750 285g	2425g	3950e	3985f				2-4 x5 4-316x416	15.63	Stanley740	None	Bijur	None	None	None	None	JeF Own.	
50	2250	2450	2275e 2700e	3150e	3450f (3700f	125 130	30x3½ 34x4½ 34x4½	Own	4-31/4x41/4 4-33/4x55/6 6-33/8x5	15.63 22.50 27.34	StarSKL4 Stearns-KnightSKL4 Stearns-Knight6	Rayfield. Rayfield	A-L West	1A-K	m-d Own m-d Own	Own	If Climax	\$4F Tim !2F Own !2F Own.	
	1005		1985e		1895d		32x4		6-31/4x41/2						s-p B&B				
5b	975 1275	1685 785g	2085e		1595d 2385 f 1550d	124 112 119	33x4½ 31x4		6-31/4x41/2 6-31/8x41/2 6-31/2x5		Stephens	Stromb.	Delco Wag Remy	Delco Wag Remy	s-p B&B s-p Own	Mech	m Mech	1/2F Tim.	
		1750	∫2400e	2750			33x43 g		6-374x5	36.01	StudebakerBig Six				e-p Own			-	
95	1995 2790e		2550d 2670a	3490		120		Own	6-3%x5 4-43%x6	27.34	StutzKLDH	Stromb	Remy	Remy				1/4F Own.	
75 75	3165e 1175 1275	(3015			1795d	117 115	33x4 32x4	H-S	4-316x5	30.63 19.60 23.44	Tulsa E-1-2-3 Velie 58	Zenith	Dyneto	Conn	an RAR	Muncio	len.	E Salie	
	1990		1890d	(2490‡	2095d 2690d	125 120	32x41/2 32x41/2	Cont.	6-31/6×41/2 6-31/4×51/4 6-33/6×41/2	29.40 27.34	WestcottD-48 WestcottC-44	Rayfield.	Delco	Delco	s-p Dooley s-p B&B	B-L Warner.	m Peters	1/4F Tim.	
	2475			1795 3275e	2490d 3475f		32x41/2		8-31/4x4	33.80	Wills Sainte ClaireA-68			1	m-d Own				
35	2875c 1235	2790		∫1695e	1795d	127	32x41		8-31/4x4 4-35/4x41/9	32.80	Wills Sainte Claire . A-68 Willya-Knight 20		Deleo	Deleo	m-d Own m-d Own	Own	m Own	14F Eato	n.
	3600	1435 3100		(1595c	1995 f f 4550 f	124	32x4½		4-35/4x41/2 6-33/4x51/4			Till	A-L	A-I	m-d Own m-d Warner	Own	f Own	ME Own	

MISCELLANEOUS
a-2 Passenger, d-5 Passenger
b-3 Passenger, e-6 Passenger,
c-4 Passenger, f-7 Passenger,
g-Chassis Price,
h-All Metal Type,
k-Soft Top Type,
n-Tire Size 32x4 %,
p-Sport.
r-Price without starter and demountable rims. Price, complete, \$414.
s-Price without starter and demountable rims. Price, complete, \$443.
†Standard Phaetons.
†Brougham

ENCINE
Anst-Ansted
Bea-Beaver
Cont-Continental
Dues-Duesenberg
H-S-Herschell-Spillman
Lyc-Lycoming

CARBURETOR
Ball & B—Ball & Ball
Till—Tillotson
Strom—Stromberg

STARTING, LIGHTING IGNITION
A-L—Auto Lite
G-D—Gray & Davis
L-N—Leece Neville
N. E—North East
West—Westinghouse
Wag. Remy—Wagner Remy.

CLUTCH
c—Cone
n-d—Multiple disc
s-p—Single plate
B & B—Borg & Beck
B-L—Brown-Lipe

GEARSRT
B-L—Brown-Lipe
G-L—Grant-Lees
Mech—Mechanics

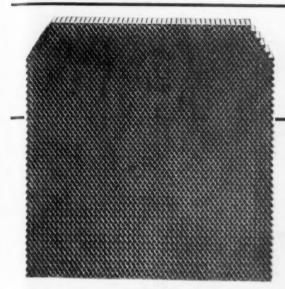
UNIVERSAL f-fabric m-metal M&E-Merchant & Evans Mech-Mechanics

REAR AXLE
F—Floating—Semi-Floating
% Floating—Semi-Floating
% F—Three-Quarter Floating
Col—Columbia
Salis—Salisbury
Tim—Timken

†Gear

4.60 3.75

4.08







Why should a Dealer handle anything that doesn't net him a good profit?

The answer is:

"He shouldn't!"

THE only reason we mention the lighter weight, increased efficiency, and more economical performance of the New FEDDERS Shallow Cores, is to emphasize the fact that they cost the dealer no more and build him a better business than

ordinary cores of unknown makes.

There's real money in the Radiator Replacement Business. Small investment, good turnover, new friends. More income without increasing overhead. Have you *tried* it?

Full particulars by return mail.

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Factory and General Offices-Buffalo, N. Y.

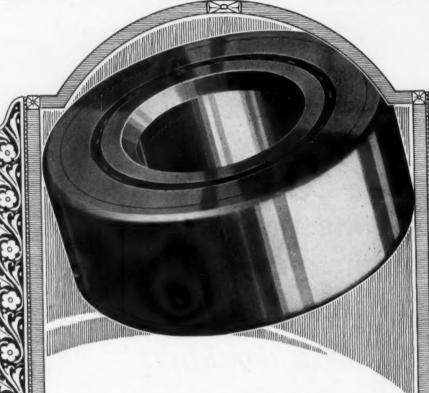
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3610 Superior Ave., N. E.
INDIANAPOLIS
Seth Klein Radiator Service Co.
820 North Meridian St.

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Olympian Radiator Repair Co.
218 W. Adams Ave.

BALTIMORE
Enterprise Auto Radiator Wks.
1908-1912 Frederick Avenue
SAN FRANCISCO, CALIF.
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New Departure Ball Bearings



The Secret of Quiet Gears

"Gears do not require adjustment to compensate for wear, so a correct position once attained should never be altered," says a leading authority on gears.

Therefore, a type of bearing which must be adjusted for wear naturally disturbs the original setting of the mating gears every time the bearing is "taken up".

time the bearing is "taken up".

As a result, the gear must "wear in" in a new position and noise develops.

New Departure ball bearings do not wear—are, therefore, made non-adjustable, and are ideal for supporting and locating all types of gears.

Interesting Literature on request

THE NEW DEPARTURE MANUFACTURING COMPANY

Detroit

Bristol, Conn.

Chicago



New Ruggles Model Breaks Price Records

YOU'VE heard rumors of the new Ruggles "Go-Getter." Here is the truck itself. A three-quarter-ton truck—genuine Ruggles quality throughout, selling at \$795 chassis price, f. o. b. factory.

Special 32-H. P. motor with automatic carburetor and battery ignition. Pressed channel steel frame, long springs, ball and roller bearing rear axle with bevel gear drive. Wide roomy seat with ample leg and arm room. A real job all the way through.

The Go-Getter is selling fast to grocers, butchers, florists, department stores, laundries, etc. It completes the Ruggles line of economical transportation units up to 5,000 pounds capacity. Write for new folder on the quick-selling "Go-Getter" and details of the Ruggles franchise offer.

RUGGLES MOTOR TRUCK COMPANY

Saginaw, Michigan

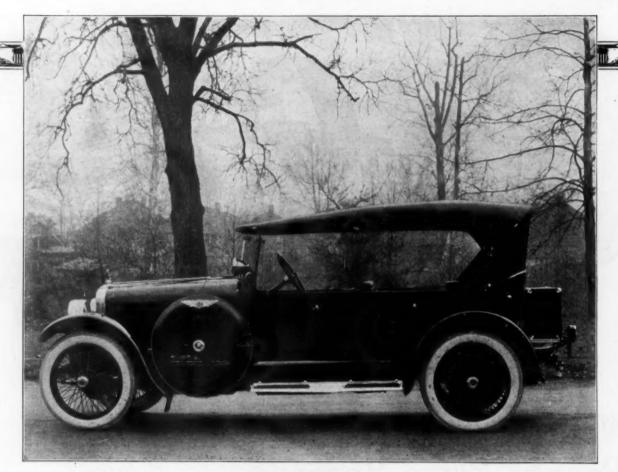
Canadian Factory: Ruggles Motor Truck Company, Ltd., London, Ontario

The Ruggles Go-Getter Chassis is so designed that standard body equipment for any light truck can be mounted on it without alteration

\$795.
(Chassis)



RUGGLES
The World's Greatest Truck Value



The New H. C. S. Six

The Name of

For twenty-four years, each year has brought more power to the reputation of Harry C. Stutz as a designer and builder of the finest motor cars.

Wherever there are people who know and acquire the better things of life, the H. C. S. car is known and acquired. This substantial background offers a sales probability that is plus!

H.C.S.

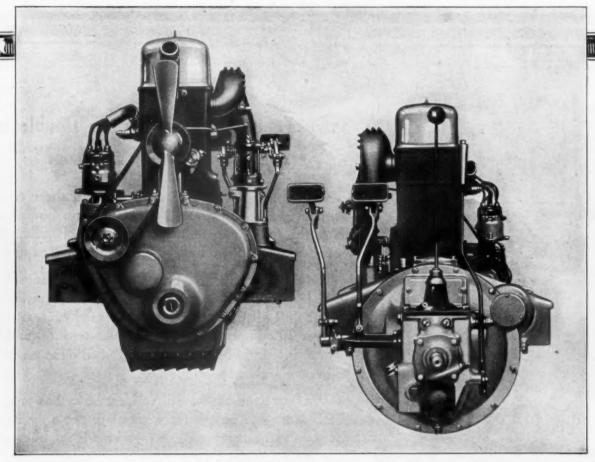
DESIGNED AND BUILT BY HARRY C. STUTZ
H. C. S. Motor Car Co., Indianapolis

SERIES IV

SIX TOURING, \$2650

FOUR TOURING, \$2250





Front and Rear View of New H. C. S. Six Motor

Harry C. Stutz

The H. C. S. Four already has won its place in buyer favor. Now comes a Six with the same splendid attributes. These are the best cars Harry C. Stutz ever built.

The reputation of this man and the excellence of his product furnish the atmosphere you want back of the car you sell. Liberal discounts, ample territory and a moderate investment characterize the H. C. S. franchise.

H.C.S.

DESIGNED AND BUILT BY HARRY C. STUTZ
H. C. S. Motor Car Co., Indianapolis

FOUR ROADSTER, \$2250 · FOUR BROUGHAM, \$2850 · FOUR COUPE, \$2600





Illinois Publishing & Printing Co. (Publisher Herald & Examiner) Chicago, Ili.



Standard Oil Co., of



Blont Lumber Company, Lacina, N. Y.



Sanger Brothers, Dallas, Texas.



THE TROY CONTRACT IS A MONEY MAKER

Be sure and send for our plan which shows how transportation can be sold. You can become a transportation engineer. No obligation as the plan is furnished free. Write or wire today.

Show Your Prospects How to Double or Triple the Truck's "Pay Load"

With a line of Troy Trailers you can show truck owners and your prospects how they can double or triple the "pay load" of any material they handle, and yet add practically nothing to the tire and fuel expense.

The big feature of the Troy Contract is the fact that there is a TROY TRAILER for every line of business. TROY TRAILERS are now being used successfully in over 200 different lines of business with 86 makes of motor trucks, in the most congested cities as well as in overland transportation.

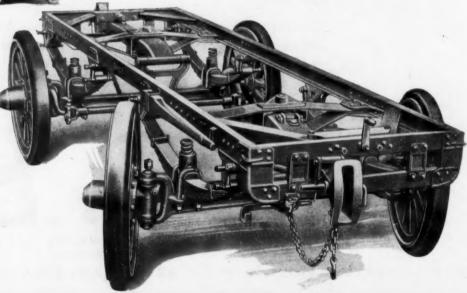
TROY TRAILERS are the oldest as well as one of the best trailers on the market today, not only from the standpoint of material and workmanship, but their adaptability to any class of work.

There is still some excellent territory open, and if you are interested it will pay you to investigate immediately.

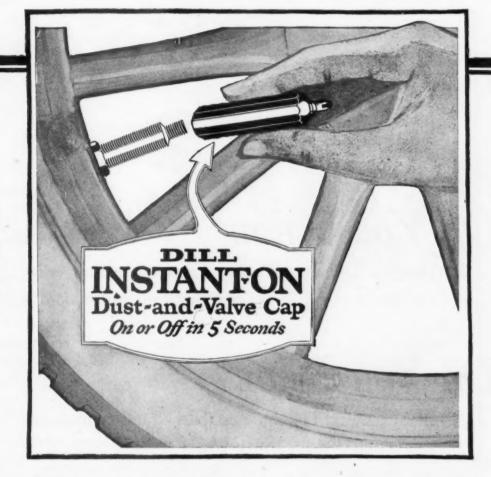
The Troy Trailer & Wagon Company

Builders of hauling equipment for over thirty-five years

TROY, OHIO



Many of the leading car manufacturers specify these caps as standard on their tire equipment. Look for Instant-ons on the valve stems of your tires.



This Valve Cap goes on in an Instant

INSTANT ON combines in one unit the heretofore separate valve cap and dust cap. But it does more—its ingenuous construction enables the car owner to put it on or take it off in half the time required by either the ordinary dust or valve cap alone.

Give Instant on a turn or two, then slide it the rest of the way, a couple more turns and it's on. Order from your jobber. If he cannot supply you write us.

Retails at one dollar for a box of five

THE DILL MANUFACTURING CO., Cleveland, O. Also Manufacturers of Dill Standard Tire Valves and Dill Valve Insides

JD)][L]L

TireValves and ValveParts

Do You Know

that Diamond Tires are standard tires and quality throughout,—no better tires made?

Do You Know

that the Diamond Rubber Company makes only one grade of tire,—the best that can be produced?

Do You Know

that Diamond Tires have established and maintained this reputation for thirty years?

Do You Know

that Diamond Tires showed one of the largest gains in sales over preceding years of any of the leading brands, due to these facts?

Do You Know

there are over 2,000,000 Diamond Tires in use, riding out the facts of Longer Service—Lower Cost.

THE DIAMOND RUBBER COMPANY, Inc., Akron, Ohio

Diamond Tires



The Rustiest Nut Is Loosened

No matter where it is, or how fast it's stuck, TASGON will quickly dissolve the rust, lubricate-and free the

Rusty Springs Squeak No More

No jack or wedge is needed. TASGON penetrates the corroded surfaces between spring leaves like magic—dissolves the rust—lubricates—and brings back the same smooth spring action that influenced the sale of the car when it was bought.

The Engine Is Rid of Carbon

An ounce of TASGON, applied to your motor every 500 miles, will rid it of carbon forever. Inject through pet cock or spark plug opening-preferably at night-when the motor is warm.

TASGON also cleans spark plugs. Primes the motor.

Squeaks Disappear from Body Parts

A little TASGON on a cloth removes rust and grease from nickeled parts.

TASGON dissolves the rust on hinges and door lockslubricates them so they work easily.

And it has hundreds of uses on the car and in the garage.

TASGON dealers are furnished with a sales-bringing assortment of live counter display material. Our trade proposition will interest you. So will the discounts.

Write for the details-NOW.

POLYGON PRODUCTS CO.

141 MILK ST., BOSTON, MASS.



Here's the can that will save a hundred times its cost—in time, labor and

TASGON The Magic Fluid That Dissolves Rust

An Outstandingly BETTER FAN BELT



Gilmer Radiator Lacing in individual cartons is going across big. If you haven't got it, you are missing a lot of sales. THE quality of the new Gilmer Super-Service Fan Belt is not guessed at. It is proved. Countless tests in the shops and on the road have shown beyond the shadow of a doubt that the new belt is superior.

The new metallic finish makes of the new belt a most attractive piece of merchandise. This finish, however, was not put on for looks. It is the result of the new process of manufacture. It gives the belt a remarkable resistance to the ravages of heat, oil and water.

There are more miles of life in the new belt. It is more flexible, lighter in construction and the toughest belt that ever drove a fan.

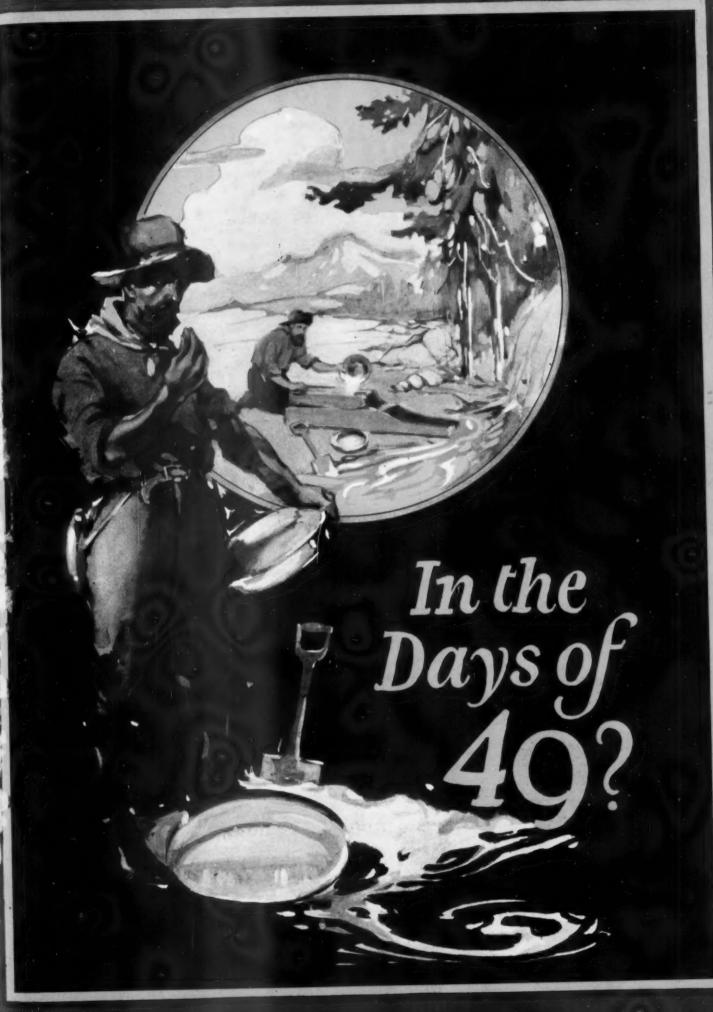
You can sell two of these belts where you sold but one before. They come in pairs—held together by narrow blue paper bands. The first goes on the car. The second is the spare—it is sealed in a glassine envelope to keep it clean until used.

The new belt costs more. It is intended for those motorists who are willing to pay for an ultra-fine belt—and their name is legion. If you haven't already stocked the new belt, write your jobber at once for complete information.

L. H. GILMER COMPANY, Philadelphia

List Prices: For Ford Cars, 60c; For All Other Cars, 90c





Where are the "Gold Miner in the Automotive Busie

Gold mining and selling automobiles have a great many things in common.

Some miners, like some automobile dealers, spend the best part of their lives seeking the pot of gold at the end of the rainbow—and never find it.

While others (like a still smaller number of automobile dealers) are making money hand over fist, and have given up *prospecting* as an undesirable and unprofitable end of their business.

The secret of their success, if you can call it that, lies in first discovering the vein of gold, and then mining it as rapidly as possible with the most modern and productive equipment.

The Search Begins

Like every other business man, you have one outstanding reason for being in business—to make money. You know by now how much money you made or lost last year.

You expect to show an increase this year—of course. But how?

Will your search for the elusive dollar find you panning gold from some lucrative and profitable stream or will you still be in quest of the far-away rainbow? Do you know where to look for sales in large volume that will make profits a certainty? Are you backed by the right merchandising co-operation? Are you fortified against the keen competition you are sure to meet during the balance of the year? Are the cars you are selling of a popular type at a popular price? And finally, do you face another season confidently and with assurance of larger profits? If you cannot answer these questions to your own satisfaction, it is time that you consider seriously the following facts.

The Facts Face Up

Actual figures compiled by one of the leading mercantile agencies of the country show that 17% of all automobile dealers are making real money, while the other 83% are barely making a living.

How do you classify—in the 17% or 83% group?

There are three factors that enter into this unusual condition.

The first is the car; the second is the market, and the third is the co-operation you receive from the factory organization.

The story of the introduction of the Columbia Specialized Six is now pretty well known throughout the industry. Few lines of cars have gained more rapidly in popularity or in desirability from the dealer's standpoint during the past year.

The Car

The car is built right and serves right. Never before has a six cylinder motor car built throughout from standard specialized units such as Timken Axles, Continental Motors, Borg & Beck clutches, and Auto-Lite electrical equipment, been available at so low a price.

No wonder it is an easy car to sell—and keep sold. Columbia value is so pronounced and its dependability so thoroughly established, that buyers everywhere are selecting it as the ideal car for the average American family.

The Market

Columbia Motor Cars are deliberately planned to give the greatest number of buyers the kind of a car they want at the price they can afford to pay. And by the same token, the Columbia dealer franchise is deliberately planned to provide a progressive business man with a merchandising proposition with which he can make more money, more easily.

By detailed analysis we find 8.9% of your gross population to possess means with which to buy a Columbia Six. You can reach 85% of your entire market with one of the splendid Columbia Sixes.

The Co-operation

You cannot know unless you have tried it, how helpful are the merchandising plans we provide for use in every dealer's territory—a practical method for locating possible buyers without wasted sales effort, direct-mail merchandising, localized advertising, retail sales contests, and many other practical business-building aids. A large national advertising campaign is increasing Columbia's nation-wide prestige.

These are all a part of the Columbia opportunity—results of our purpose of seeing to it that Columbia dealers move the cars and make money—for the men we want are men who expect and get a better than average return on their investment. Columbia Motors is cleared for action—prepared to furnish its dealers with all the cars they want, when they want them. Our dealers are taken care of on production.





Some interesting facts and figures-

Here, then, are some of the more important definite advantages available to the dealers who handle the Columbia line:

- 1 A line of easily sold cars—Sixes at the price of Fours and closed cars at the price of open models—values that can be measured on the basis of standard, specialized units of known worth.
- A better than average margin of profit on each car sold.
- 3 A minimum investment, allowing more frequent turn-over of invested capital.
- 4 A greatly simplified trade-in problem.
- 5 Low service cost and much smaller parts stock investment.

- 6 Co-operation of a number of nation-wide parts service organizations.
- 7 Selling helps of unusual variety and effectiveness, including really practical localized co-operation.
- 8 A strong, well-established manufacturer, plus a dozen nationally known prominent organizations behind the car you sell.
- 9 A pedigreed chassis, built of such units as Red Seal Continental Motor, Timken Axles, Borg & Beck Clutch, Spicer Universal Joints, Gemmer steering gear, Auto-Light starting and lighting and other quality units of nationally recognized merit.
- 10 A share in the future development of the Columbia principle of specialized production —a future well indicated by the progress of the

To get back to the statement we made in the first place, you are in business to make money.

How can you make money in this business?

By selling the largest possible number of cars with the least amount of sales resistance, at the greatest possible net profit.

This is the opportunity Columbia offers. It is an open opportunity in a number of highly desirable territories, to capable, well-financed dealers. It is an opportunity that may be open to YOU.

Your success in 1923 and in the years that follow depends largely on what you do NOW—on the connection you make and on the possibilities thus placed before you.

Columbia stands ready to show you in detail what a Columbia connection offers.

Now is the time to join the Columbia Sales Organization



Five-Passenger Touring



Special Six Phaeton



Special Sport



Sport Roadster



Five-Passenger Sedan



Two Passenger Coupe



Write for this Book

We will gladly send any interested dealer a copy of this book that shows you how to make more money in the automobile business.

The Columbia Six for 1923 Offers Unlimited Money-Making Possibilities

After a close check-up among all automobiles offered in the thousand dollar class; following detailed analysis of mechanical construction; giving due consideration to the worth-while facts; and placing a proper appraisal upon their value; one is ferced to the conclusion, that, never before has anyone built a six cylinder car of specialized unit construction which equals the new offering of Columbia.

If you were to take a pad of paper and a pencil and mark down all the service-assuring features in every automobile priced at near \$1000 and make a careful digest of the facts, you would arrive at an appreciation of the fact that Columbia is building the kind of a car that 85% of the people want—at a price they can afford to pay.

For this is the first time a six cylinder car, built throughout from standard specialized units has been offered at so low a price. This fine Columbia Six has been made possible only because of a new type of co-operation existing between Columbia and the world's largest builders of specialized units of established merit.

After you analyze the Columbia six cylinder chassis, from its 50 horse power Red Seal Continental Motor to its Timken Axles, from its Borg & Beck Clutch to its Spicer Universal Joints, you find the basic reason why Columbia dealers are making money; and why it would be advisable for you to get in touch with us immediately.

COLUMBIA MOTORS CO., DETROIT, U. S. A.

Columbia Specialized Six

-and specialization brings perfection

You and I Will Make Some EASY MONEY

I've worked out the simplest and handiest little device ever invented for auto drivers and I want your help to put it over.

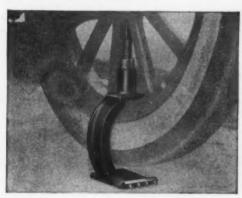
I am willing to split with you on profits.

If you will write me, we will fix up some territory that you can have exclusively. It will be your territory and you can collect more money every year than you probably ever made out of anything before.

The beauty of it is your income will increase from month to month.

No sensible driver is going to monkey with an old style jack when he can get the Jiffy Jack cheaper than he can buy a good screw jack. Why should any driver grease up his sleeves or get his clothes all dirty crawling around under the car digging holes or why should he spend his time hunting boards to set the jack on when he can use the Jiffy?

STOP—Here's a puzzle. How does she work?
"Well, I'll be gol-darned—Why didn't I think of that?"



The Jiffy Jack is extremely simple. It has no moving parts and nothing to wear out. It's easy to operate; requires no strength (your car does the work), which means everything to the woman driver. No bending over; no getting under your car; no getting your clothes dirty—and—the Cost Is Low.

He doesn't even have to stoop over with the Jiffy and he spends no time screwing it up and down.

The car doesn't slip off the Jiffy and smash down just when you get the tire off either-it can't.

Any woman or any kid can use the Jiffy just as well as a man.

No Arguments Against the Jiffy

Can you think of a single argument why anyone with good sense should or would buy an old style jack when he sees the Jiffy?

It doesn't matter much what you are doing now, I can make you a better proposition. You have been waiting for something to turn up so you could make some easy money. Well, here it is. I'm ready—are you?

Thousands of people have already heard of the Jiffy Jack—good news travels fast. The price hasn't even been published but we are getting hundreds of letters that read something like this:

"Send me one of those Jiffy Jacks. I don't know what the price is or I would send you a check. Send it along and send me a bill or send it C. O. D. I'm sick of those old dirty screw jacks."

A lot of fellows are writing in for the agency but I want to pick out a bunch of good ones so that we can get together next New Year's and congratulate each other on our foresight and success. When we get the right bunch together and put her over big we will enjoy each other's company.

If you are a dead one don't write, but if you are a live one come on—I'll let you in on some easy cash.

'Atta Boy-I can see you pick up the pen right now.

C. F. Aldrich, Sales Manager

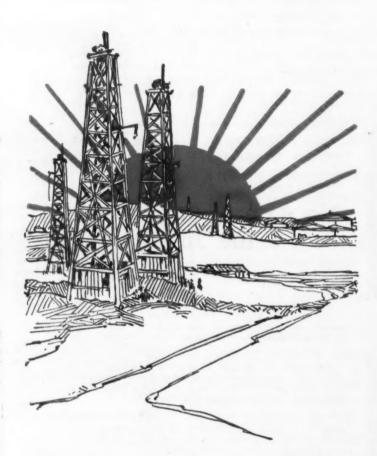
JIFFY-JACK COMPANY, Inc.

Dept. 302, 1401 Hennepin Avenue,

MINNEAPOLIS,

MINNESOTA

This is the Day SPECIALIST



AR owners are realizing that the specialized product outlasts and outserves the ordinary kind. The fan belt scientifically designed and constructed to meet every special requirement and backed by over thirty years of belting experience gives most satisfactory service.

STRAIGHTLINE

ENDLESS FAN BELTS

Service woven into every strand. Impregnated to resist heat, water and oil.

Every motorist can now demand the fan belt especially made for his particular car.

SINCE 1902, "CAMEL HAIR" Belting has been used extensively in the oil fields, where it has come to be acknowledged—

"The Peer of Oil Field Belts"

SIPPACIE IN SIPPACION SIPPACIONES SIPPACIO

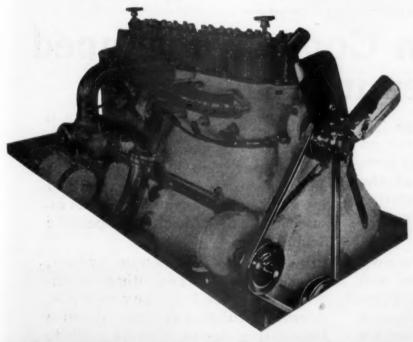


The Individually Packaged Fan Belt



STRAIGHTLINE Fan Belts.

the first to be sold as a packaged product, come packed in individual silicated boxes. Ten of these boxes are furnished in an attractive display carton. This handy package has a direct buying appeal for every car owner.



This Guarantee Sells

PERMANITE

TRANSMISSION LINING FOR FORD CARS

If Permanite Transmission Lining, properly applied, does not give the service you think it should, return it to your dealer, who will exchange it for a new package without charge."

Permanite never loses its firm, velvety grip.

Complete set packed in individual carton—three strips of lining with brass rivets. A fast-turnover article.

Order through your jobber.



ALEMITE

High pressure lubricating system



Alemite counter in Jem Tire Company store

How the Jem Company Jumped Their Alemite Sales 175%

"In the four months we have had the Alemite Display Cabinet on our counter our Alemite sales have increased 175% over those of the previous four months," writes J. Jones of the Jem Tire Company of Cleveland.

"This attractive Cabinet tells its own story. Our trade knows we sell Alemite. And the handy Equipment Manual enables us to show a customer just what he gets for his money, or if he has lost an Alemite fitting from some part of his car, it quickly tells us what to sell him."

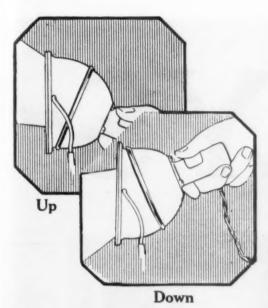
What the Jem Company is doing is being done also by thousands of dealers who are taking advantage of the quick turnover and big profits assured by the new Alemite Co-operative Selling Plan.

In addition to the Alemite System, this plan includes two other nationally advertised money-makers, Alemite Lubricant and Alemite Lubricating Spring Covers. Write today for complete details of our proposition.

A Product of

THE BASSICK MANUFACTURING COMPANY

2662 North Crawford Avenue, Chicago, Illinois Alemite Products Co. of Canada, Ltd., Belleville, Ontario



A New Spotlight

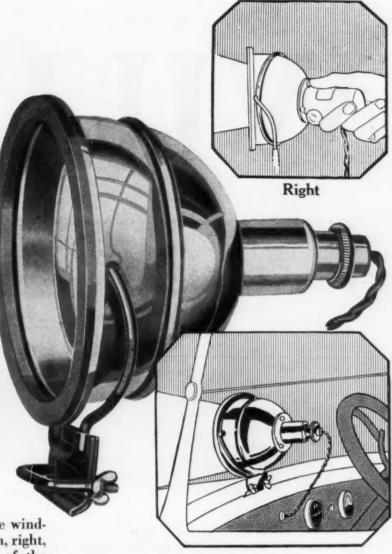
—Operates from INSIDE the Windshield

Makes protruding, rattling spotlights out-ofdate—Fits all cars

F ITS snugly against inside of the windshield—can be pointed up, down, right, left, like any spotlight. Out of the weather, out of the dust—only spotlight for closed cars or open cars when curtains are in use. Absolutely no back-glare.

Doesn't interfere with opening of windshield to any position. Fits any car. Fastened to top, side or bottom of windshield.

Unattached in four seconds for use as a trouble lamp. Guaranteed not to rattle.



Sheet brass, heavily nickeled; double parabolic reflector.

Appropriate for finest cars.

Sells on sight. Nothing radical about Inshield or its mounting. Utility quickly recognized by all motorists. Dealer ask your jobber—Jobber ask us.



The Spotlight
Inside the Windshield

This Light Profitably Merchandised by the Jobber

The Thal and Bitter Machine Co.

Toledo, Ohio

WILLYS





This illustration appeared in a strong double-spread in the February 24th Saturday Evening Post, announcing the new Willys-Knight 7-passenger Sedan

BACKED by powerful advertising, Willys-Overland dealers are making 1923 the greatest moneymaking year in experience. Sales are amazing. Chicago sold 519 in one week. Toledo sold 336 in five days. Minneapolis sold 105 in four days! Profits are big everywhere.

OVERLAND



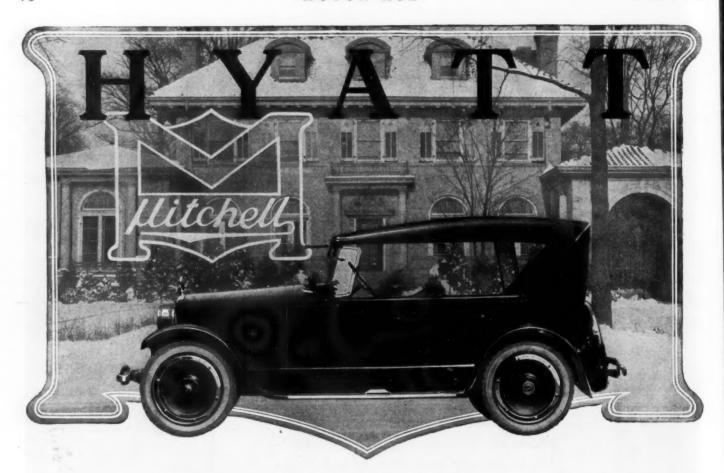
J. Motor Company, Yanceyville, N. C., writes: "Little more than one year ago we commenced to sell Overlands and Willys-Knights on small capital. For the last year we have done about \$60,000.00 business and there are now twice as many Overlands in our territory as all other kinds combined, except one."

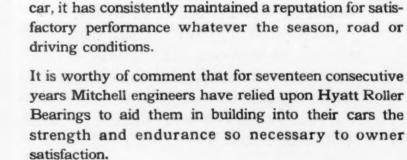
John Schock, Willys-Overland dealer in Woodhaven, L. I., writes: "Seven years ago my capital was enough to buy one car. Today I own the property and building where my salesroom stands. I'll tell any man he can't do better than tie to Willys-Overland."

If you believe in yourself, and have ambition, write us today for franchise details.

WILLYS-OVERLAND, INC., TOLEDO, OHIO Willys-Overland Ltd., Toronto, Ont.







Hyatt Roller Bearings contribute in no small measure to the strength and quiet operation of the Mitchell transmission—to the rugged trust-worthiness of the Mitchell rear axle and to the simplified design and efficient performance of the Mitchell pump and fan unit.

*HE Mitchell car is one of the veterans of the automotive industry. Since the early days of the motor



A Hyatt bearing with part of outer race removed to show the spiral rollers,

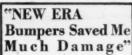
Hyatt Roller Bearing Company

Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington, (W. Va.) Minneapolis
Philadelphia Cleveland Pittsburgh Buffalo Indianapolis

HYATT QUIET BEARINGS

NEW ERA EVERYWHERE



of damage. "I was wedged in between two cars, with a string of cars on eight all jammed together. My car to worst of the blow. The two bumper pureaut logether like a concerting, ever, they straightened out nicely, damage was one bent arm on the bumper, which a blacksmith straig out in a few minutes.

Easily Installed

out July 15th I purchased front and NEW ERA BUMPERS and am cer pleased with them. I made the in tions myself, every part fitting ea

New Era Bumpers Save Car After Six-Foot Plunge

JOHN J. WILLIA Los Angeles, Nov. 20, 1922.

Texas Hassler Dealer Praises **NEW ERA BUMPERS**

LOS

"I cannot tay too much in favor EW ERA BUMPERS for Ford ci-hey are the last word in bumper or traction—particularly when used in c-scition with Massler Shoch Absorbers, HASSLER TEXAS CO, Harry Merytthew, Pruside Dallas, Texas, May 22, 1922.

NEW ERA BUMPERS SAVE CAR and DRIVER

DALLAS

VICKS

"The writer has had quite an accident white has had quite an accident purpose of your three would undoubtedly are been far more series; damage to the accident purpose of your head of the purpose of the

The New Sport Duplex. 134" size, Black Japan \$14.50; 21/4" size, full Nickel only, \$24.

The New Duo-Convex. Black or Nickel. Price, \$12 to \$22, according to size and finish.

Down 12-Foot **Embankment** Hits Tree_Safe!

"In regard to the DUPLEX bump tich I sent you to be repaired, I wish te that this bumper was installed a front of a 1922 Model 45 Buick C

riche car went over a 12-foot embanding a tree. Were it not for bumper I can safely say the radiator fenders would have been demolated fenders would have been demolated with both receiver. The Richer Recourse of I. S. SEAGERT. Richer Because of New Era Bumpers"

Ford Engineer Praises NEW ERA

BUMPERS vant to say a few unsolicited EW ERA BUMPERS. They'v

Guaranteed

without refree, no matter

what may have

serve. If dam- Duplex Bumper. For medium cars, black, front and rear, \$14.50. Nickel, \$2 extra. For cars of aged, replaced the Ford class, \$12 and \$13.50.

been the cause Standard Spring Bumper. For small cars, black, \$10; nickel, \$11.50. Larger cars, black, \$14.50; nickel, \$2 extra.

Lower in Price Than Others of Comparable Quality

We always invite comparison of NEW ERA Bumpers with others in quality and price. NEW ERAS are made of the best spring steel. We KNOW their material and workmanship. That is why we guarantee them unconditionally. We could not do this were they not built to withstand tremendous shocks. Few are damaged. These we replace free.

NEW ERA SPRING & SPECIALTY CO. SMALLEY DANIELS, President

Grand Rapids, Michigan Export Dept. 130 West 42nd St., New York City

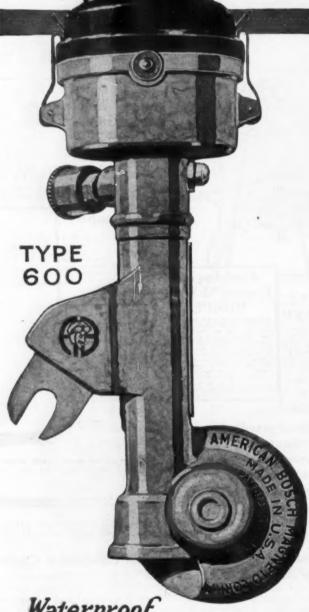
There is a Message for You in These Car Owner's Letters-

It is a message of satisfied customers. Satisfied customers mean permanent trade. NEW ERA Bumpers are not only first class themselves, but they put the stamp of QUALITY on the dealer who sells them. There can be only one BEST, in anything. In BUMP-ERS it is the NEW ERA line. Twenty styles-a wide enough range in model, finish and prices to satisfy the most discriminating buyer. No need to lose a customer if you have a complete stock of NEW ERAS. No dead stock, either. They fit ALL cars by means of interchangeable attachment arms. These we exchange without charge.

The two new styles, the Sport Duplex and the Duo-Convex, are the last word in efficiency and beauty. They put a crowning finish upon a line that already has been popular for five years.

Write for Catalog and Dealer's Offer.

Your 1923 Make Your



Waterproof Automatic Evenly Timed Powerful Boys, it's your BIG chance for 1923!

—a chance for big sales, real profits, more prestige—

Think of it—a genuine Bosch Ignition System, suitable for all Ford models—at only \$12.75.

Price is the only thing that has kept thousands from buying in the past.

Now every Ford owner should buy—the price is low, and the new Bosch System is a world beater! It makes a wonderful improvement in the Ford—adds power, smoothness, speed, easy starting.

B O IGNITION F

Opportunity Store Ford Headquarters

Type 600 is a cinch to sell! Get the Ford owners to try it, and they'll sell each other—

Rain and cold weather are causing Ford owners lots of trouble right now—that's your opportunity—they'll buy quick at this season—make your store a regular Ford headquarters.

Wire your order for a sample fitting, C.O.D., and start your sales drive immediately. Full particulars on request.

American Bosch Magneto Corp.
Main Office and Works: Springfield, Mass.

New York

Chicago

Detroit

San Francisco

SCHHEM FOR R D S

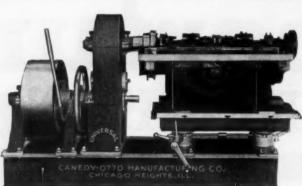
What it does

- 1-Makes Easy Starting
- 2-Keeps Plugs Clean
- 3-Prevents "bucking"
- 4-Gives More
- 5—Saves Gas and Repair Bills
- 6-Stops Timer Troubles
- 7-Pays for Itself
- 8-Prevents Short Circuits
- 9-Cuts Down Vibration
- 10-Eliminates Spark Lever



\$12⁷⁵

CAN CONTRACTOR



No Other Burning-In Machine Has These Essential Features

The C-O Universal Burning-In Machine embraces every feature necessary for a quick and perfect job of burning-in and running-in bearings, regardless of the type of engine or its size. It is the one machine that makes perfect work scientifically certain.

Instant and positive alignment of engine crankshaft and driving spindle are assured through the single control over the raising and lowering mechanism of the table, an exclusive advantage. Equally vital is the advanced method of mounting any and all types of engines so that the bearings are in full view during the burning-in operation.

Through the oil sump in the table, another unique feature, adequate lubrication is supplied to bearings during the running in operation. Also, completely assembled engines can be run in under their own power, with the convenient attachments provided. This is an invaluable power saver.

Another great betterment, the silent chain drive, makes detection of motor noises easy. The hand wheel enables the testing of bearings for a perfect fit. Vibration is eliminated through the rigid mounting on the heavy channel base.

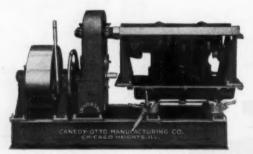
In excellence of design, quality of materials, and accuracy of workmanship, this machine stands alone. Hundreds of satisfied users declare it the most profitable unit of shop equipment ever manufactured. Furnished with or without electric motor drive. for catalog.

Address Dept. A.

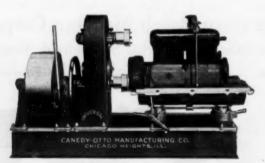
CANEDY-OTTO MFG. CO.

Manufacturers of Automotive Equipment, Drills, Punches, Shears, Shrinkers, Countershafts, Grinders, Buffers, Forges, Blowers, Tuyere Irons and Blast Gates

Main Office and Factory—Chicago Heights, Ill. New York Branch—407 Broome St.



Through the exclusive suspension method employed, de-tachable-head and V-type engines are readily mounted so that the bearings are in full view during the burning-in operation. Position alignment of driving spindle and crankshaft is assured by single control of table.



During the running-in operation, the oil sump in the table acts as the lower half of the engine crankcase, assuring adequate lubrication. Silent chain drive enables ready detection of motor noises. Vibration is eliminated by rigid mounting on heavy channel base.









"I would not take the OMAC off my Pierce-Arrow for \$500 if I thought I could not get another OMAC to take its place!" writes one car owner.

Outstanding Features

Demonstrated in Actual Service on America's Leading Cars

- Efficient at all altitudes
 —and in all weathers, winter and summer.
- 2. Extraordinary efficiency at low speeds.
- 3. An instantaneous response to the throttle at all speeds.
- 4. Only full-vaporized gasoline enters the mixing chamber, no matter how weak the engine's suction.
- 5. Marked fuel economy definitely and immediately
- Quick and easy cleaning
 —only 4 nuts to loosen
 and the whole bottom portion is removable.
- 7. Utter simplicity of design.
 Positive mechanical action.
 No springs, tensions, or
 automatic devices. No
 counterweights in float
 chamber.
- 8. Only one adjustment—on the idling unit.

It makes a difference on a car.

"A much quicker acceleration, a quicker start, an instant response at all times to the slightest foot pressure," writes another owner.

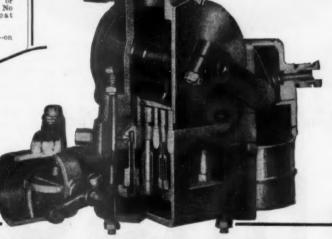
And it makes a difference to the Dealer.

When he sells an OMAC he is **sure** of the consequence. He knows that he will have no expensive service to give, no kicks, no comebacks.

Like a great many other definite improvements in mechanical designs and construction — the OMAC is simple. It is hardy, compact —not easily hurt.

It has no springs, tensions, automatic devices. Its action is positive. Its performance is the nearest to perfection as yet attained.

If you're looking for one more good, dependable, profitable business - building trouble-free product to add to your line for 1923, write for full information TO-DAY! We promise you a quick reply and the kind of proposition a high-grade gogetter will appreciate.



Carburetor

THE JENNINGS CORPORATION

Pittsburgh, Pa.

404 Richland Avenue, Homewood Station

10

Points of Superiority

- 1. Indestructible cable indestructible lock.
- 2. Can't be cut or smashed off.
- 3. Keyhole cannot clog—has automatic closing device.
- 4. Lasts a life-time.
- 5. Rust-proof dust-proof—theft-proof.
- Can't rattle.

- 7. Fits all kinds of tire carriers.
- 8. Lowers insurance premiums.
- 9. Backed by Johnson reputation for quality.
- 10. Nationally advertised.

Built like a bank vault

Approved by the Underwriters' Laboratories, Inc.

Johnson

SPARE TIRE LOCK

Dealers!

You can sell it with certainty that your customers will be permanently satisfied

It is now false economy to attempt to protect spare tires with ordinary padlocks. A good blow from a small sledge hammer will smash them off, while wires, chains, cables or steel strips can all be easily severed. Paying a little more for a Johnson Spare Tire Lock—and getting a life-time of real protection—is a much wiser investment for the carowner. Dealers sell it with the certainty that their customers will be permanently satisfied.

The Johnson Spare Tire Lock is built of heavy aircraft cable which cannot be cut because it is entirely covered, or armored, with hardened steel sleeves or rings. As they are interlocked, and because they revolve freely, they turn from under every blow. Smashing or cutting anything as eel-like as these beads is a practical impossibility.

The lock itself is a specially hardened steel block with rounded corners. It hasn't the padlock's shackle to be pried or smashed off—no high spots or projections of any kind to be attacked. Its keyhole cannot clog with the

dust and dirt that sometimes make an ordinary lock impossible for ANYONE to open, because it is protected by an automatic keyhole closing device. A Johnson Lock is rust-proof—dust-proof—and thief-proof.

It's an indestructible cable—a burglar-proof lock—and a reduction in insurance all in one unit that will last a life-time.

Approved by all the insurance companies, and saving 5% on theft insurance premiums in practically all localities, the Johnson Spare Tire Lock is carried by leading jobbers to fit every make of car. It is manufactured by the makers of the famous Johnson Transmission Lock, more than 300,000 of which are now in use. Ask your jobber for prices and discounts on Johnson Spare Tire Locks—or write us direct. When you think of the number of carowners using makeshifts to protect their spare tires, you will realize the big market there is for a real spare tire lock. WRITE US TODAY, Dept. B.

JOHNSON AUTOMOBILE LOCK CO. ST. LOUIS, U. S. A.

Also makers of the famous Johnson Transmission Lock

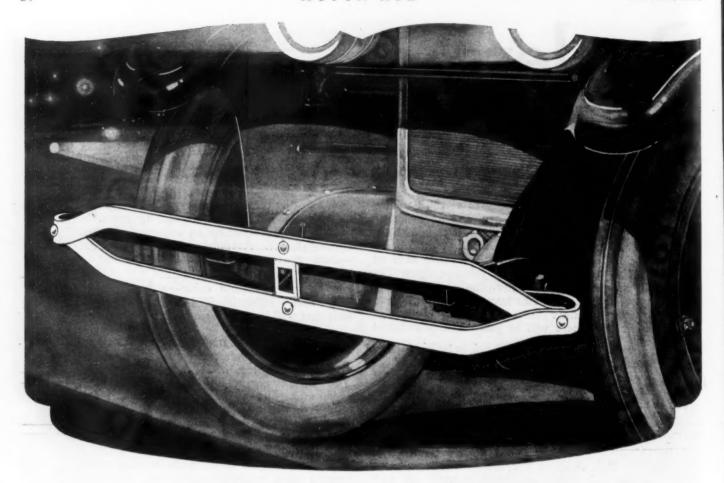
Nationally Advertised

The Johnson Lock advertising for 1923, appearing in page and half page space in The Saturday Evening Post, reaches millions of car owners who will see the wisdom of protecting their Spare Tire equipment with the RELIABLE Johnson Tire Lock. Dealers who can supply this demand will reap profits. Order from your jobber today.



Johnson

SPARE TIRE LOCK



In the Spot Light of DEMAND!

Drivers who are proud of their automobile can't help buying this new "Full Doubleface Halladay Bumper."

Those who have no bumpers now, as well as those who have old style bumpers, are discarding their present equipment to buy this new "Halladay."

Every "Halladay" Bumper is spring-steel, heat treated, hardened in oil and drawn to the proper temper in our scientifically heat controlled furnaces.

"Halladay Full Doubleface" adds a snappy appearance to any car and makes an exceptionally smart bumper for people who desire the very best.

Leading jobbers stock them.

Write direct to us for catalog describing:

"Full Doubleface," "Doubleface," "Singleface," "Light Car Special," Halladay Bumpers.



L.P. HALLADAY COMPANY, DECATUR, ILLINOIS, U.S.A.

with this Model B WEAVER New-Way Jack



New features

TELESCOPING STANDARD can be dropped to minimum height of 8 inches, sufficiently low to be inserted under any car axle, and raised to a maximum height of 17½ inches, high enough to reach unusually high axles.

STANDARD SLEEVE supports standard rigidly when drawn up to its maximum height and prevents binding under heavy loads.

ROLLER BEARINGS are located within axle housing, instead of within wheel hubs, preventing undue friction and wear under side thrust.

REAR CASTER is clamped to jack by heavy bolt and can easily be replaced if damaged. Two sets of ball bearings reduce friction and prevent binding.

UNUSUALLY HEAVY. DURABLE WHEELS that will stand up under the hardest service. Can be had with heavy rubber tires at a slight additional cost.

It's an easy matter to get a car out of a tight place in your garage or repair shop in a hurry if you have a Model B Weaver New-Way Jack. If you haven't room to operate from the front or rear of the car, you can insert the Jack from the side of the car as illustrated above. The long body of the Jack enables you to reach the axle with ease and the fact that the wheels of the Jack pivot and are controlled by the handle makes it easy to guide the Jack into just the right position under the car the first crack out of the box.

The wheels of the Jack can then be cut in line with the car axle and the car drawn directly sideways without having to raise it high enough to permit the rear end of the Jack frame to pass directly under the car.

This is only one of a number of exclusive features of this new Model B that will enable you to give quicker, better service and thus increase your profits. We have prepared a special folder describing this Jack in detail. Your copy is waiting to be mailed. Won't you write for it today?



WEAVER CANADIAN COMPANY, LTD. Chatham, Ontario





Just such and factory as your have



Tire dealers find success with the General line because the men at the head of General's organization were once tire dealers themselves. The picture which you have in your mind of the ideal factory is probably just the same as theirs.

A striking illustration of this is the fact that General never took any part in the cut-price hysteria. General dealers never have had anything to apologize for. In times of business prosperity, or depression, their sales have kept right on going up, because they were always selling an absolutely honest value for no more, or less, than it was worth.

The men in the General's organization look at the tire business with a dealer's eyes, which are unclouded by many years of prosperity. Success has not made them unduly proud, because they know that a whole lot of the credit has been due to the class of dealers who have been attracted to the General's distributing system.

An agency for The General Tire makes you one of a family of men who know the tire business from all angles. Playing fair with one another has given them a wonderful success, which you can share in, if your territory is not already taken.

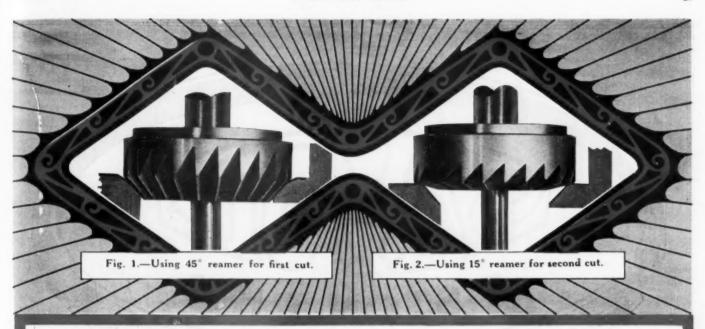
Write for the 1923 proposition for Class "A" dealers.

GENERAL CORD TIRE



THE GENERAL TIRE AND RUBBER COMPANY

AKRON, OHIO



How to Reface Valve Seats for More Accurate Fitting

IN reaming valve seats mechanics often find difficulty in centering the reamer over an uneven guide hole.

When this happens it is necessary to recut the valve seat to get it into alignment with the hole. Then, after reaming a second time, it is usually found that the seat has been reamed so far that it is too wide for a good tight seating of the valve and often with a bearing surface wider on one side than on the other.

This difficulty is avoided, and a quicker and more accurate job obtained, by proceeding as follows:

Make the first cut at 45° in the ordinary way with the Sioux Valve Seat Reamer. (See Fig. 1.) Then take a 15° Sioux Reamer and bevel off the top of the valve seat as shown in Fig 2. Work down until the lower line of the 15° cut measures a little below the outside diameter of the valve face.

Now take your 75° Sioux Reamer and reface the lowest

part of the valve seat as shown in Fig. 3. Cut down until the upper line is a little above the inside diameter of the valve face.

Your valve seat will now appear as shown in Fig. 4, and in absolute alignment with the guide hole. It is now perfectly centered and the proper width for most lasting results. The 15° and 75° reamers can be used with the same results on the 30° or 60° valve seats.

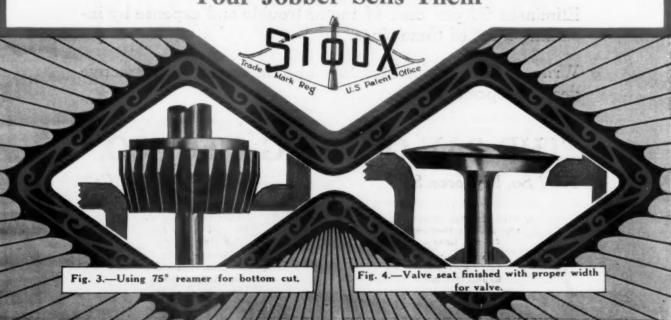
All possibility of chattering of valve seat is prevented simply by inserting a piece of 50 lb. wrapping paper, large enough to cover valve seat, on the stem against cutting points of reamer. Write for free sample.

When ordering 15° and 75° valve seat reamers the 15° should be the same size as the valve head, and 75° in most cases should be approximately 1/8 inch smaller.

Any size 15° and 75° Sioux Reamer may be obtained at the same prices as corresponding sizes of 45° reamers. Write for catalog and valve seat reamer specifications.

ALBERTSON & CO., SIOUX CITY, IOWA

Your Jobber Sells Them





The Piston Ring With Positive Mileage Guarantee

We positively guarantee SAV-OIL Piston Rings to give you 1000 Miles to the Gallon of Oil or your money refunded, providing your cylinders are not scored or out of round. Only one SAV-OIL ring required for each piston.

Eliminate 90 per cent of motor trouble and expense by installing a set of these rings.

Write or wire us for literature and details of our attractive dealer proposition.

THE SAV-OIL RING MFG. CO.

1037 So. Figueroa St.,

Los Angeles, Cal.

SAV-OIL PISTON RING CO., 2056 Jackson Boulevard, Chicago, Illinois.

> H. W. BLEVINS, 1532 Grand Ave., Kansas City, Mo.

SAV-OIL RING MFG. CO., 550 Golden Gate Ave., San Francisco, Cal.

C. H. MOUNTJOY & CO., 211 Third Street, San Antonio, Texas. for Economical Transportation



The Awakening

Important changes in public sentiment are usually slow in growth, but sudden in expression.

Success in any business depends on ability to sense a change and adapt one's action to meet it.

For several years the sentiment of automobile buyers has been shifting towards economical transportation.

The Chevrolet Motor

Company has been fortunate in correctly interpreting this sentiment and in supplying a line of cars in harmony with it.

Witness then, the sudden rise of Chevrolet from seventh to second place in sales.

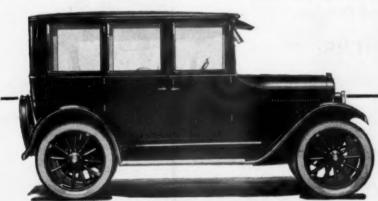
How does this change affect you?

Are you with the tide of trade or against it?

Chevrolet Motor Company

Division of General Motors Corporation

Detroit, Michigan



5-Passenger Sedan \$860 f. o. b. Flint, Michigan

Dealers and service stations everywhere. Applications will be considered from high grade dealers only, for territory not adequately covered.

All Prices f. o. b. Flint, Mich.

Two Passenger Roadster .	\$510
Five Passenger Touring	525
Two Passenger Utility Coupe	680
Four Passenger Sedanette .	850
Five Passenger Sedan	860
Light Delivery	510



Thumbworn in Service

I T'S unusual to find a NEW copy of The Tire Rate Book. No other reference book gets so much actual handling by men in the tire business.

It fills the every-day needs of the tire dealer, distributor, and manufacturer. It gives important data that these men must have and which is available in no other form quite so handy or comprehensive.

It is a ready source of information on tire and tube sizes, prices and supply sources, rim data, comparative price schedules, standard telegraph code, legal data, etc. A special press sheet service makes available to subscribers the very latest price changes.

No one in the tire business should be without The Tire Rate Book. Subscription \$1 per year issued January, April, July and October.

MANUFACTURERS:

This is a wasteless medium for reaching more than 10,000 select dealers and distributors—a market for tires, tubes, manufacturing and service equipment, pumps, tire accessories, etc. Rates on request.

THE TIRE RATE BOOK

A Class Journal Publication

239 W. 39th St., New York City

FORMS for the April
issue close March
10. Reserve space NOW.



9 Out of every 10 of your customers need a new Jack

Prove It Yourself

You know how many cars come equipped with poorly constructed, cheap jacks. You have sold good jacks to the owners of hundreds of such cars. But what about the other hundreds who have these same makes of cars and the poor jacks which came with them? Have you asked 'em to buy?

It's easy to sell them new jacks. Here's the way one wide-awake dealer recommends:

"Jot down the makes of cars which come equipped with poor jacks. (Look in a few of the tool boxes in the cars in your shop, if you aren't sure.) Then when a customer comes in for gas or repairs you can make a pretty good guess

from the make of his car whether he needs a dependable jack."

Show him your stock of Reliables. The No. 9 for light cars—the No. 46 for heavier cars—or the new No. 5-A with its 34-inch detachable folding handle. He is bound to like one of the Reliable line. And it will be an easy job for you to sell him one.

Over 5,000,000 Reliable Jacks have already been sold. Are you getting your share of the profits of the 6th million? Write for our catalog and price list of the complete Reliable line.

ASK 'EM TO BUY

Elite Manufacturing Company, Dept. MA3 Ashland, Ohio.

Northwest Branch—G. A. Ashton Co., St. Paul, Minn.
(Complete stock carried in Ashton Building.)
Southwest Branch—Carroll Co., Dallas, Texas.
(Complete stock carried in Carroll Warehouse.)

REPRESENTATIVES:
Motor Products Co., 149 Church Street, New York.
L. E. Spencer Co., 704 Stahlman Building, Nashville, Tenn.
A. E. Mohrig, 1454 Pine Street, San Francisco, Cal.



No. 5-A



No. 9



No. 46

RELIABLE JACKS



Finds the weak cell without taking battery out of the car-



A HOYT CELL TESTER will help eliminate the costly time waste that is part of almost every battery trouble hunting job that reaches your shop.

For, Hoyt equipped, your mechanic doesn't have to take the battery apart—OR EVEN OUT OF THE CAR—to find the misbehaving cell.

He simply places two sharp steel prods, one on the positive, the other on the negative terminal of the cells—AND READS DIRECT. The high grade voltmeter tells the battery's condition at a glance.

A Hoyt Cell Tester in your shop gives the kind of accurate, speedy service that will please both you and your patrons.

Each Burton-Rogers advertisement this year will reveal one of a series of the important tests possible with our line of instruments.

Save the advertisements—or write for the full story which has been put into book form: "Hunting Down Electrical Troubles"—which also gives some pertinent service hints to mechanics and repair shop owners.

Ten cents-to cover postage-will bring you a copy.

THE BURTON-ROGERS COMPANY

Sales Department—Hoyt Electrical Instruments 755 Boylston Street, Boston, Mass.

Branch Offices and Distributors in All Principal Cities Hoyt Instruments May Be Purchased From Your Jobber

TO ALTONOMICA DE LA COLONIA DE



BURTON

THE jobber is your business partner.

By carrying many products just as cheaply as he can one, he divides the distributing costs on all—and this is reflected in the lower prices a manufacturer can afford to give you.

When the jobber's salesman calls next time, treat him as your friend. He's all of that—and a lot more.

ROGERS

"The Best-Equipped Shop of Gets the Business"



The Greatest Opportunity for **Truck Dealers Since 1920**

Model "SPECIAL DELIVERY"

> A speed truck of 1923 design at a 1923 price



1500 pounds to 2500 pounds payload capacity. Con-tinental Red Seal Motor, Salisbury Spiral Bevel Gear Rear Axle, Michelin Steel Disc Wheels, Detroit Gear and Machine Co. 3 speed truck transmission. Get the rest of the facts.

Model

11/2 Tons Capacity Standard of the Average Trucking Need



The perfect truck for general hauling, cartage, inter-urban trucking, lumber haulage, department store de-livery, bus work, farm hauling, etc.

Continental J A Removable Cylinder Head Motor, Aluminum Shell Radiator, Brown-Lipe Main-Frame Transmission, and Multiple Disc Clutch, Timken Worm Drive Rear Axles, Heavy Pressed-Steel Frame, Radius Rods.

Model

2½ Tons Capacity

The most handsome and efficient brute on the market





Our determination to build the finest 21/2 ton chassis on the market has met with a success in Model 25 — ac-claimed by the entire truck world.



JUT of a fire test, raging at fierce heat for years, the motor truck industry has emerged. The "dross" has been removed. The "pure gold" in the industry has been refined.

Now we are on the threshold of a year more promising than even those war-inflated years—a year that assures sane and great prosperity for the wise dealers who will prepare for it by acquiring the right line.

A name stands out — refined to pure gold — Commerce!

Will you heed it? Can you see the advantage of dealing with a company that has no old inventory handicapping their efforts, and yet with thirteen years of consistent truck-building experience? A clean, strong company with a square deal waiting for you? — a line of only three chasses — (no "excess baggage") - just three real sellers and real satisfaction producers in every trucking need?

Then act. Write for the Commerce facts. Learn why this is the line of real profit for you next year - next month - now. The time for holding back has passed. The time for making money is here.

The Commerce franchise and 1923 combined, offer you the greatest opportunity since 1920!



COMMERCE MOTOR TRUCK CO.

7424 Mackie St.

Detroit, Mich.

Export Dept., 132 Nassau St., New York City



Get Ready for June

Serve tourists gasoline the Bowser way, and they'll buy oil, tires, spark plugs, and other accessories.

Satisfy them going out, and you'll get them coming back, for Bowser dry-and-clean gasoline service always brings repeat business.

Install Bowser pumps and Lube-sters now to be sure of the tourist trade. Write for booklet A-14 and our other sales-helping folders.

S. F. BOWSER & COMPANY, Inc.

Pump and Tank Headquarters

Home Plant: Fort Wayne, Indiana

Canadian Plant: Toronto, Ontario

Factories and Warehouses: Albany, Dallas, Milwaukee, San Francisco, Sydney Branch Offices, with Service Departments, in Principal Citles in This Country and Abroad Representatives Everywhere



Bowser Products For Handling Gasoline and Oils Wherever Sold or Used

Filling Station Pumps and Tanks for Gas-

Portable Tanks for Oil and Gasoline.

Storage and Measuring Outfits for Paint Oils, Kerosene and Lubricating Oils.

Carload Oil Storage Tanks.

Power Pumps, Dry Cleaners' Underground NapthaClari-fying Systems.

Richardson-Phenix Oil Circulating and Filtering Systems and Force Feed Lubricators.

Write for Bucklets



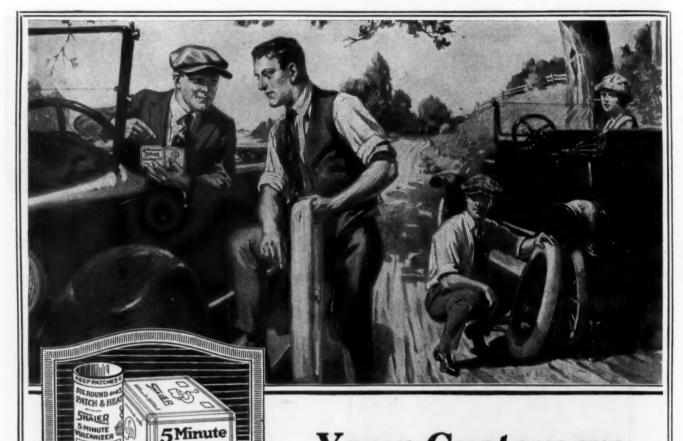
To supply dealers, garagemen, and car owners with permanently leakless American Hammered Piston Rings, one of the largest quantity productions in the replacement parts industry, has been made necessary.

The American Hammered line, complete

in all sizes and oversizes, is handled by leading jobbers in all parts of the country. A quality ring at a low list price, a complete line, and national distribution—these features explain why thousands of dealers today are handling American Hammered Piston Rings.

Ask your jobber.

AMERICAN HAMMERED PISTON RING COMPANY, Baltimore, Maryland-Export Department, 461 Eighth Avenue, New York, U.S.A.



Your Customers Help you sell 'em

Notice how the fellow, who has a Shaler Vulcanizer in his tool-box, likes to stop and "show" the out-of-luck motorist how much better it is than "stuck-on" patches.

Right away there is another convert to the idea of 5-Minute Vulcanizing, and the first dealer who has his stock of Shaler Vulcanizers out in sight grabs off an easy sale—and another booster is ready to show off for the benefit of the next puncture-victim he finds on the road.

And so it goes. There's something about the 5-Minute Vulcanizer that makes everybody want to show other people how it works.

Get More Helpers

The more vulcanizers you sell, the more helpers you will have and the more repeat business you will get on patches to use with the vulcanizers.

Write us for the window and counter display material that we furnish to help you say, "Here it is."

C. A. SHALER COMPANY 209 Fourth Street Waupun, Wisconsin

SHALER 5 MINUTE VULCANIZER

SHALER

Retails for \$1.50

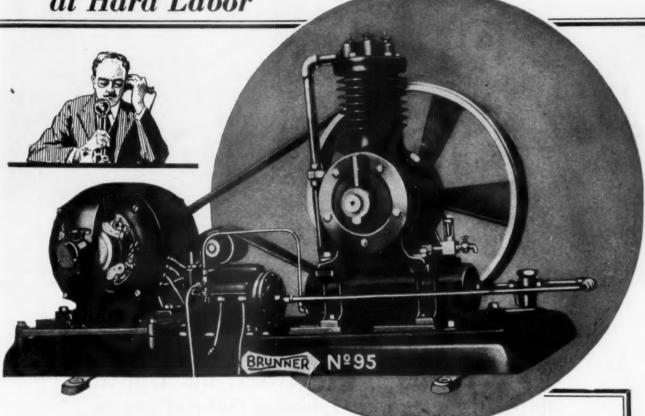
The Outfit Includes

the Vulcanizer, 12 Patch-&-Heat Units (6 round for punctures and 6 oblong for cuts)

—ready to use—with complete instructions.

BRUNNER AIR COMPRESSORS

Good for Twenty Years at Hard Labor



Silent!

You can converse, or telephone, or dictate while your Brunner is running at full speed, without knowing (from any noise it might make) that a compressor is near at hand.

The reasons for this silence are:

Ground surfaces that glide silently through their cycles.

A Balanced load eliminating all strain.

A belt tightener of special design that holds the tension even.

A solid locked assembly—rigid, unswaying, self-contained.

High speed, light weight, non-sniffling valves.

In short, a machine embodying real mechanical excellence—free from vibration and rattle—with power beyond its immediate requirements, and a consequent ease of operation.

Model 95

Belted Power Plant

A powerful and rugged assembly, incorporating heavy duty No. 105 Brunner Compressor, 1½ H.P. motor, automatic unloader - controller, unique Brunner adjustable belt-tightener. Cap. 5.9 cubic feet of air per minute. Designed for heavy service and for high pressure, this model will find ready favor with air users who haven't floor room for a complete unit with tank. (Full description in our new catalog "Air Profits," a copy of which will be sent on request.)

Your Jobber Carries Brunners. Ask HIM About Them.

BRUNNER MFG. CO., Utica, N. Y.

Cincinnati 1st Nat. Bk. Bldg. Kansas City 1805 Grand Ave. San Francisco 607 Santa Fe Bldg.



AFTER exhaustive tests of various shock-preventing devices, the United States Government selected Gabriel Snubbers as standard-equipment on its General Motors and Ford war ambulances. Gabriel Snubbers are standard of the world. In America alone, 37 makes of cars are standard equipped—manufacturers of 34 others put holes in frame for them.

Sold by legitimate dealers

GABRIEL MANUFACTURING COMPANY

1415 East 40th Street

Cleveland, Ohio



SNUBBERS THERE IS NO OTHER



Keep You On The Seat-Save Your Car



This Pedestal



And This Circular





This Counter Display

Use These Tested Sales-Makers

This pedestal puts a Monogram Cap right in a man's hands. He opens and examines it, giving you the finest chance to start your talk. Almost always a six-dollar sale results—sometimes one for twenty dollars.

The display board shows the shields as well as Monogram Cap. No one can help stopping to admire the brilliantly enameled shields it holds up to the eye. So there's another sale started.

Hand every customer a circular along with his change. Though he can read it in four minutes, he'll remember it four years. Generally he buys a Monogram Cap within four days, for nothing else offers him as much value for the money.

Your Monogram Distributor will tell you how to get these sales-makers. Ask him now.

GENERAL AUTOMOTIVE CORPORATION 625 West Jackson Boulevard Chicago, Illinois



Sealed and Guaranteed





Here's an opportunity for every automobile dealer

The new R&V Knight Six has created interest all over the country. In every community a few high class car buyers will want this car.

This means sales without excessive effort. The guarantee means sales, free from engine servicing expense.

Get this clean profit

With your overhead expense otherwise met there is no reason why you can't profit from these *extra* sales. If you don't take them some one else will. Our selling plan is unique. You do not have to

stock the car. You may even get along without a demonstrator. Fill out and send the coupon to find out *how* you can make this profit.

R & V MOTOR COMPANY, East Moline, Ill.

R&V Knight Six

"EVERLASTING PERFORMANCE"

Request for Information ------

R & V MOTOR COMPANY, East Moline, Ill.

Without obligation send me more information about the R&V Knight Six. I am interested in care-free economical motoring. Name .

Address

City.

State . .

M



A 2000 lb. squeeze!

How we put 40% more material into Thermoid Brake Lining

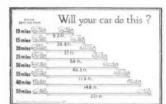
The giant hydraulic press shown above compresses into every square inch of Thermoid Brake Lining 40% more material than is put into any other brake lining on the market today.

Your customers not only get longer wear out of Thermoid-

They get a brake lining that needs fewer adjustments. A dense, compact lining that wears down evenly-that is always there.

Tell your customers this

"Thermoid Brake Lining is compressed in the factory, instead of on your brake



Famous Thermoid Stopping Chart —shows distances in which car should stop if brakes are efficient. Brakes lined with Thermoid meet these standards.

drums, with you paying for the needed adjustments!

"The 'squeeze' is taken out of Thermoid before it leaves the factory

"And 40% more material is put in its place!

"Thermoid wears down instead of mashing down-and it doesn't 'grab' or slip. You'll get constant gripping power with Thermoid till your lining is worn wafer-thin."

These facts are building brake lining business for thousands of dealers and garage-men today. And Thermoid advertising will help them this year by telling this story to the millions of motorists from coast to coast.

Are you getting your share of the relining business that is being done with Thermoid? Write today for prices and full information about sales helps furnished to all Thermoid dealers.

THERMOID RUBBER COMPANY Factory and Main Offices, Trenton, N. J.

Chicago Los Angeles Detroit Kansas City Seattle Atlanta London Paris Turin



The new ThermoidBrakeRelining Machine. Cuts time 60%does a better job than old hand methods.

Price \$15. Write for special offer to Thermoiddealers.

hermoid Brake Lining

Hydraulic Compressed

Makers of "Thermoid-Hardy Universal Joints" and "Thermoid Crolide Compound Tires"



"Black as ink-and only ran 100 miles"

How a new Ford transmission lining puts an end to this fouling of oil

Oil as black as ink—thick with sticky bits of tar and other foreign matter—fouled up long before its time—

That's the trouble millions of Ford owners have had to contend with due to transmission

There are two kinds of transmission linings for Ford cars. The untreated lining—containing nothing but cotton—fails to grip and wears down quickly. The ordinary treated lining soon dissolves its compound in the oil, fouls it up and lessens its lubricating value. The entire power plant suffers.

For years Ford owners have needed a lining which would grip without partially dissolving its compounds in the oil.



After 48 hours in oil, four makes of lining, A. B, C and D, had discolored the oil, giving off tar and other harmful ingredients. The only lining that did not foul up the oil was E—Rexoid.

This startling test proves new Rexoid lining insoluble in oil

And ONLY in Rexoid do you find this treating compound. It is pressed—practically vulcanized—into every fibre of a high-grade woven fabric. This hydraulic compression gives Rexoid uniform gripping power until the lining is worn wafer-thin.

It also gives Rexoid

- 1. More material to the square inch
- 2. A smoother, more even surface and a longer life.

Above all: Rexoid does not foul up the oil that goes into your motor!

Tell your customers about Rexoid. It fills a definite need in every Ford car. This means continuous profits to you.

Leading jobbers carry Rexoid. If your jobber cannot supply you, write us, giving his

THERMOID RUBBER COMPANY

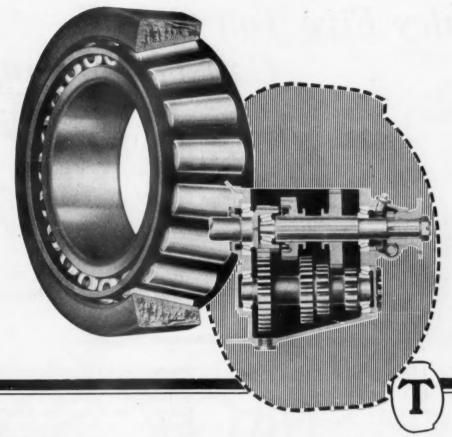
Factory and Main Offices, Trenton, N. J.

New York Cleveland Boston; Chicago Kansas City London Los Angeles Seattle Paris Detroit' Atlanta

REXOID

Transmission Lining for Ford Cars





For Silence in Transmissions

In no mechanism is quietness more indicative of mechanical refinement than in automotive transmissions.

In attaining this quietness the use of Timken Tapered Roller Bearings is an important factor, as is indicated by the increasing use of Timkens in this service. There are now 103 makes of cars and trucks with Timken-equipped transmissions.

Silence depends upon gears kept in perfect mesh by shafts properly mounted and held in correct alignment—despite the strain of radial loads and thrust loads and resultant loads under high speed conditions. Timkens in transmissions do just that—

Initially, because they carry all combinations of loads, with greater capacity per unit of space than any other type of bearing—resulting in smaller, more compact housings—less resonance—greater silence—

And finally, because silence is maintained in Timken-equipped transmissions, by the adjust-ability for eventual wear—which keeps shafts in permanent alignment, and which keeps gears in perfect mesh.

The Timken Roller Bearing Co

© 1923, T R B Co, Canton, Ohio

TIMKEN
Tapered
ROLLER BEARINGS

A Manley Five Ton Crane Can Handle any Job!



Get the Big Heavy Jobs the other fellow can't handle

You can tackle any job quickly, easily, and with perfect assurance that your 5 Ton Crane will have more capacity than you need.

For this abnormal heavy duty service the two independently operated chain hoists are an absolute necessity (see lower cut). You can make two hitches to a wreck—pull in on one chain fasten—then the other—hold with one chain while another hitch is being made, etc. You can therefore twist a wreck to suit conditions as well as tow more advantageously. The necessity for the two chains will be seen at once.

The Manley 5 Ton Crane has the tilting beam, the double truss rods, the four leverages, and in fact every feature of the Manley 2 Ton Crane. These features have demonstrated themselves to be absolutely necessary for a Wrecking Crane to be successful and practical. They are patented and exclusive to the Manley Cranes.

Send for the Manley Catalog of Wrecking

Send for the Manley Catalog of Wrecking Cranes. Start now reaping the big profits this Crane will make for you. 2 and 5 Ton capacities. 5000 Cranes in the hands of 5000 users for five years means that you take no chance when you buy a Manley Crane.

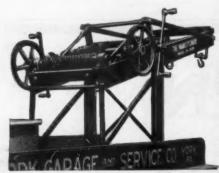
THE MANLEY MFG. CO., York, Pa.



rigidly when towing and making it always possible to get a hitch.



Look at this wreck—see how it was picked up, one chain supporting the front, the other chain hoisting the rear end.



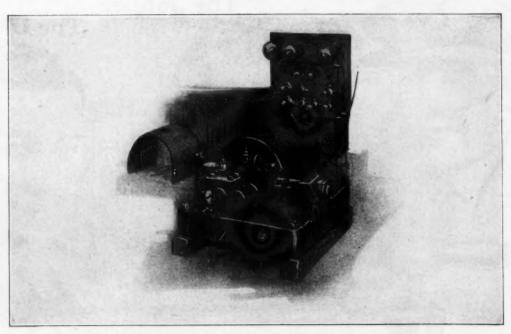
The two independently operating chain hoists of the Manley 5 Ton Crane are plainly shown. The tremendous leverage is obtained by using quadruple chains to lift the load. As these four chains hold the load there is a big safety margin. Provision is also made to use the Crane with a single chain in the middle for the lighter jobs.

"The Best-Equipped Shop Gets the Business"

WITH

Manley
Garage Equipment





SPECIAL MACHINE DEVELOPED BY S K F RESEARCH LABORATORIES FOR CONDUCTING FATIGUE INVESTIGATIONS

High Fatigue Limit of Atlas Balls Insures Long Life in Service

ACCURACY in ball size, sphericity and finish alone does not determine the life of a steel ball. Neither is mere crushing strength—the ability to withstand the constant application of a stationary load—any indication of the ability of a ball to withstand the stresses to which it is subjected.

Unless these stresses which vary not only in magnitude and direction but in point of application as well, are withstood by the ball material, fracture and failure occur. It is to fatigue —the inability to withstand varying strains and stresses — to which most ball failures can be traced.

Atlas Steel Balls are noted for having a resistance to fatigue that is not surpassed and seldom approached by any other commercial ball.

This high resistance to fatigue is the result of elaborate investigations that are constantly being conducted by us on special machines developed for the purpose. It is such investigations and elaborate tests which insure to the ball user the utmost in quality, uniformity and service from Atlas Steel Balls.

ATLAS BALL COMPANY

Glenwood Ave. at Fourth St. . . Philadelphia

ATLAS

ALSO BRASS, BRONZE,

MONEL AND SPECIAL METALS

Made Under

SKF

Submission

SPECIAL OFFER

Money-back Guarantee



The Always-Busy OIL SALESMAN

Make a real business of selling oil and alcohol. You can build up a surprisingly large volume of selling with up-to-date equipment.

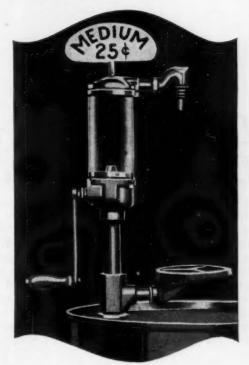
Other dealers are doing it. If we stated figures you wouldn't believe them. The best way is to experiment, and prove to yourself that we make no overstatement. You can do so without a cent of loss—on the contrary, with much extra profit.

HANDY BEN fits any oil drum. Just set him in and tighten the nuts. No extra equipment to buy. He makes any oil drum a quick-acting silent salesman. Well-made; he'll last your business lifetime. Try him out for thirty days, and see how much of his cost he has repaid in extra sales.

Clip the coupon now, and start him working for you immediately.

Bennett Injector Co.

Muskegon Mich



ONLY \$12.75

If you take advantage of this special offer

SIMPLY fill in the name of your oil or accessory jobber on this blank, and enclose your check or money order for \$12.75. Prompt shipment will be made. Your money refunded if you are dissatisfied for any reason in 30 days.

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Specia	rial	Offer	Coupoi

011	
Ship to	
Address	Jobber's Name
City	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -
State	Address



Locates Electrical Disorders Quickly

No Garage or Battery Service Station that has once used this exceptionally useful and handy instrument would want to get along without it. Differentiated from ordinary instruments because it is WESTON and embodies the Weston characteristics renowned throughout the World. Tests everything but starting current. Has separate voltmeter and ammeter. Legible scales. Durable cables. Clip terminals to quickly connect to circuits. Replaceable fuse to protect ammeter and prevent burn-outs. Dependable—accurate—rugged—in other words, practically foolproof.

Weston Complete Testing Equipment

No. 441 "Fault Finder"—
for utility use and general testing

No. 443 Battery Voltmeter-

for taking E. M. F. of individual cells No. 453 Battery Tester— for heavy discharge battery testing

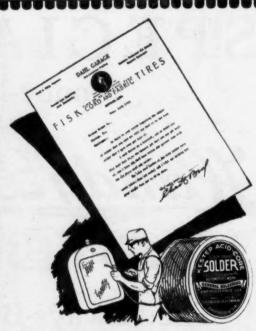
No. 280 Testing Set-

for every known electrical test

If you haven't Weston testing instruments, you cannot render the highest standard of service to car owners. Complete infor-mation gladly sent upon request. Any instrument shipped im-mediately from stock.

Weston Electrical Instrument Co. 10 Weston Avenue Newark, New Jersey





he Meanest Joh"

Chas. A. Beal, proprietor of the Dahl Garage, is right when he says-here it is-read it yourself:

"I used Kester on a radiator, and no doubt, you will know that it is the meanest job that you can get hold of, and I have the work done better and and I have the work done better and quicker than with the old-style acid and solder. The acid cores inside of the wire solder sure saves labor, time and money, and I will use nothing but your solder from now on in my shop."

We all agree with him, a radiator is a mean job and he's found how to simplify soldering it-Kester does the work.

Sold by live dealers everywhere in one pound coils, in cartons, and on one, five and ten pound spools

Manufacturers

CHICAGO SOLDER COMPANY

4203 Wrightwood Avenue, Chicago

Direct Factory Representatives: THE FAUCETTE HUSTON CO. Chattanooga, Tenn.

LOUIS J. ZIESEL CO. 216 Market St. San Francisco, Cal.

RICHARD F. ELY 66 W. Broadway New York City

KESTER Acid Gre WIRE SOLDER



Requires Only Heat



Thousands of Prospects for this Accurate Gauge!

Every Ford owner wants this scientific, convenient method of checking his gasoline supply.

Fits on the instrument board of any Ford — always in sight of driver. It tells him when to refill the tank and exactly how much gasoline to buy.

Model A for Fords made in four styles—for touring car or roadster, for 2-door sedan, for coupe, for 4-door sedan.

Dealers — Spring is close and the time is here for fast selling. Every Ford owner will need a Cole Visible Gasoline Gauge. Be ready to sell him and make the profit. Write for descriptive literature.

THE STEMCO ENGINEERING COMPANY

205-215 Webb Street

Dayton, Ohio

"Read as You Ride"

COLE VISIBLE GASOLINE GAUGE

Made Especially for Ford Cars

The Stemco Engineering Company 205-215 Webb Street Dayton, Ohio

Send me your circular describing the Cole Visible Gasoline Gauge and tell me about your liberal dealer offer.

Name .

Address

The Cole Visible Gasoline Gauge Tells:

- 1 How much gasoline is in the tank. The red indicator is always visible.
- 2—How much gasoline to order at the filling station.
- 3 How much gasoline you get when you buy.
- 4 How many miles to the gallon.

GREEN

Accessories designed to sell at good profit, and repeat, bringing more profits. Three numbers of our extensive line are shown below. They are quick movers, priced attractively, and discounted to pay well for the little effort needed to sell them. Ask for complete descriptions and discount sheets.

GREEN MANUFACTURING CO.

506 Second St., Milwaukee, Wis.



Leatherette Sun Visor

The GREEN Sun Visor can be attached to any make or model of car, with brackets furnished with each visor. Fastens securely to the windshield frame or corner post of closed cars—is well braced, will not shake loose or blow back over the top.

blow back over the top.

The frame is made of wood, completely covered with galvanized iron, making it light, yet very strong. The covering is of the best imitation leather, over satin cloth. Will stand up under all weather conditions. Waterproof; will not shrink or wrinkle. Underside green, making it restful to the eye.

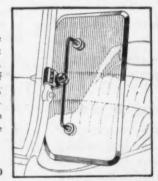
No. 654 Black Enamel Fittings, list \$4.00 No. 655 Nickel Fittings, list 5.00

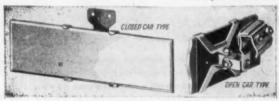
Side Wings

Fit any windshield, assume any position and stay put until deliberately moved. Heaviest, clearest grade of plate glass. All parts brass, heavily nickeled and burnished. Fastenings in glass cannot work loose. A sure early season seller.

French bevel, list,

per set\$20.00





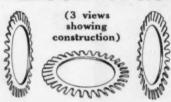
Rearview Mirror

"The Third Eye of the Driver"

REARVIEW Mirror enables the driver to view the traffic behind without looking around or taking his eyes from the road ahead. The clear lens increases the field of vision without distortion. It is securely held in non-rattling bracket; it can be instantly adjusted to any angle without altering its fixed position on the

The mirror is of beveled Belgian plate glass. Sized 2%x7", 3x8" and 3x10", black or nickel fittings; brackets for both open and closed cars furnished with 8" and 10" mirrors. Price \$1.60 to \$2.50 list.

Sell a Better Lock Washer



It is easier to sell an "improved" article and in the case of lock washers the new principle of Shakeproof Lock Washers can almost be taken in at a glance. Since the founding of the Shakeproof

organization but a short time ago, the sales of Shakeproof Lock Washers have rapidly increased as their superior working qualities became known.



Here are a few of Shakeproof points of advantage:

They TIGHTEN instead of loosen under vibration.

They are rust proof.

They can be used with shorter bolts. They give equal pressure at all points.

They are lighter and stronger than ordinary washers.

Our Quick Turnover Display Stand

Wonderfully convenient, this little stand. Set it on the counter or hang it up. Contains 200 packages of Shakeproof Lock

Washers that retail at 10c, sorted in ten sizes, plainly marked on compartments. A salesman in itself.



Price complete— 200 packages, \$12.00

Price complete— 100 packages, \$6.50

Refills a gross, \$8.64

Refills a half gross, \$4.45

Shakeproof Screw & Nut Lock Co.

Wrigley Building,

Chicago



ness in all Buick models has produced these desirable qualities in Buick cars to a degree exceeded only by the costliest, custom-built automobiles.

The new Buick 4 cylinder Sport Roadster, which was introduced at the National Automobile Shows, is a typical example, as well as the most recent Buick achievement.

Always, with each succeeding Buick model, new standard is created by nal value that it provides

Buick Dealers Are Leaders in Car Values

Because Buick is continually providing new motor car values by its unfailing anticipation of public tastes, Buick dealers always are marked in their localities as the headquarters for the newest motor car refinements and improvements. Why not have your name on file?

BUICK MOTOR COMPANY, FLINT, MICHIGAN

Division of General Motors Corporation

Pioneer Builders of Valve-in-Head Motor Cars



Branches in All Principal Cities

tandardized



All Toledo Standardized Valves are slushed in a high grade rust preventive and individually wrapped in strong kraft.



They are packed 12 to a box in a strong and attractively printed carton, properly numbered in

Toledo Standardized Valves are made in exact accordance with the tolerances of the respective car and motor manufacturers.

More valves of this type are used in original production than all other types combined.

Obviously they are the logical valves for replacement in all passenger cars, trucks, tractors, marine and stationary motors.

It is poor economy to reface a worn valve. There is more profit and satisfaction for both repairman and owner in the installation of new Toledo Standardized Valves. Ask your jobber. He has an attractive service station proposition to offer you.

Automotive Jobbers

Toledo Standardized Valves offer you a splendid sales opportunity. Detailed information furnished on request.

The Toledo Steel Products



Company



We Are Equipped to Manufacture Your Product

A large, established plant in Chicago seeks additional product merit to manufacture.

We have very modern facilities (including belt line switch-track tapping all important trunk lines) for the manufacture of machinery and railway appliances with structural, boiler and tank, electric and oxy-acetylene welding, galvanizing and tinning, and wood-working departments.

Arrangements may be made—

For manufacture and sales on royalty-to manufacture for established sales organizations-to manufacture on contract.

Efficient production - unequalled service.

Let us help you.

Mechanical Manufacturing Co. 39th and Loomis Streets, Chicago

You Can Purchase a Curtis with the Confidence It Is Right

Confidence because it is a product of experience, a reliable, tried and proven article-because CURTIS Engineers first recognize, then study and solve basic problems. The correctness of CURTIS' design has been proven repeatedly by the later adoption of these self-same CURTIS features by others. CURTIS Compressors are built to render steady service with a minimum operating expense. A few reasons why-

1 Controlled Splash Oiling System, originated by Curtis. This patented feature prevents an excess of oil getting into discharge line. At the same time perfect lubrication is assured. Curtis will run many times longer on the same amount of oil than ordinary splash oiling compressors.

2 Hand Unloader (or Curtis centrifugal unloader on automatic starting outfits), originated by CURTIS, permits starting against full tank pressure. Prevents burning out motors, blowing fuses or jumping belt.

Safety Cage, originated by Curtis, prevents broken valves dropping into cylinder and wrecking machine.

Fan Fly Wheel, originated by Curtis, helps cool the cylinder (and the intercooler on two-stage machines). Increases capac-

5 First and only Two-Stage Compressor with a Copper Inter-cooler, originated by Curtis, assuring fullest advantage of Two-Stage Compression.

6 Back of every Curtis outfit is 69 years' successful experience, 26 years of which have been devoted to the design and manufacture of air compressors.

We manufacture a complete line of both single and two-stage air compressors. A style, size and arrangement to meet your particular need. Write at once for full details and prices.

Curtis Pneumatic Machinery Co. 1527 Kienlen Avenue St. Louis, Mo., U. S. A.

Branch Office: 530-H, Hudson Terminal, New York City

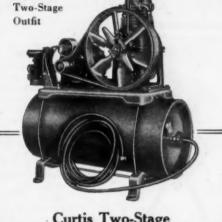
Canadian Representative: Joseph St. Mars, Winnipeg and Toronto, Canada.

"An Original Design"





Style "X" Single Stage Outfit Portable, Belt-ed or Geared. Five sizes. A.C. or D.C.



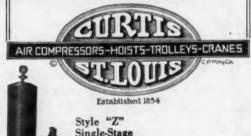
Curtis Two-Stage

In a TWO-STAGE machine the air, which has been heated in compression, is cooled while passing through the intercooler from the low to the high-pressure cylinder, thus permitting the high-pressure cylinder to handle a larger volume of the cooler and denser air. The efficiency of a Two-Stage Compressor depends directly on the degree of intercooling effected.

The degree of heat thrown off by an inter-cooler depends upon the kind and thickness of the metal and the design of the inter-cooler tube and radiating flanges.

Copper throws off heat faster than any other commercial metal. 135% faster than cast iron, 112% better than steel and 27% better than aluminum. Curtis intercoolers are made of copper.

Curtis intercoolers are approximately 50% longer and have about 100% more heat radiating fins than others. They are exposed their entire length to the cool blast of the fan fly wheel.



Single-Stage Outfit

Coupon Curtis Pneumatic Machinery Co.

Send

RTIS Single and Two Stage Air Compressors

Gentlemen: Please send me full details

1527 Kienlen Avenue St. Louis, Mo.

on Curtis Air Compressors, your proposition and prices. Name Address

Jobber's Name

Not Just ONE Profit But

When you sell a 2-R-3 TIRE CARRIER you not only collect one nice profit but pave the way for 2-R-3 more



Model Y

Simply by showing the 2-R-3 Tire Carrier many car owners may become immediate prospects for a tire, a tube, a rim, and a tire lock; things that they need but

did not know how to carry them.

Trouble on the road has convinced most motorists of the necessity of 2-R-3 spares. The motorist who only carries one is skating on the thin ice of the river of

trouble, grief, annoyance and delay.

Our attractive and convincing display stand calls the motorist's attention to his need. The simplicity of attaching 2-R-3 Tire Carriers holds an appeal that

makes easy sales.
2-R-3 Tire Carriers simply hook on the preceding tire.
No tools required to attach. No bolts or nuts to bother with.

Made in two models, S & Y, for all sizes of tires. Prices range from \$2.50 to \$7.00. If your jobber cannot supply you, write us direct.

International Stamping Company

406 N. Leavitt Street

Chicago, Illinois



Can't Blow Out-Serve Longer

-insure permanent customer satisfaction

Don't take the chance of losing a good customer through a poor gasket. It doesn't pay.

Never - Leak banishes all chance of blowouts by binding the bottom layer of copper over the top layer.

And the corners are skilfully scalloped to prevent buckling-making them absolutely heat, oil, gas and waterproof.

Never - Leak Gaskets will help you build a reputation for good repairs. No comebacks -for they can't

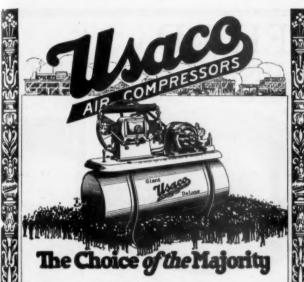
A sample gasket for any car, truck or tractor sent on request, either direct or through your jobber.

Never-Leak gaskets are listed, pictured and priced in our catalog-copy sent on request.

THE FITZGERALD MFG. CO.

TORRINGTON, CONN.

NEVER-LEAK Cylinder Head Gaskets



WHEN a product makes good with such convincing evidence that the majority naturally turn to it, that is the machine in which to invest.

Such a machine is the Usaco, a compressor that has maintained prominent leadership, with growing popularity, for many years; in the face of many attempts at imitation, and the widespread introduction of numerous inferior machines, designed to appeal primarily from the standpoint of price.

A Usaco compressor affords the greatest possible value per dollar of investment of any machine available — a fact made possible by our enormous, specialized production

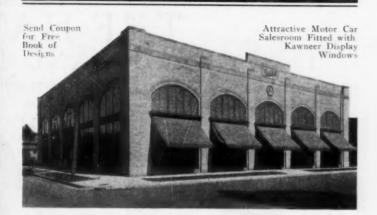
Select your compressor from 38 units, two-stage and single-stage, air and water cooled, also get literature on the new improved Perfect Balance Air and Water Tower.

The United States Air Compressor Co.

5304 Harvard Ave... Cleveland, O.

Usaco Compressors are made in a wide range of Sizes and Types
Two Stage and Single Stage Air and Water Cooled.

A unit for Every condition



Well Displayed Motor Cars Are Half Sold!

Appearance is a strong factor in automobile selling. A beautiful car properly displayed is half sold. Appearance attracts the buyer; performance sells him.

Kawneer Solid Copper Store Fronts enable the motor car dealer to display his product to greater advantage, showing up its beauty of line and finish to a high degree. Hundreds of progressive dealers are now using Kawneer Fronts to increase their sales, reporting highly satisfactory results. Attach the coupon below to your letterhead and mail today for your free copy of the Kawneer Book of Designs. This book shows styles of Kawneer Fronts which will build up business for you.



Mail Coupon Today!

The Kawneer Company, 1219 Front Street, Niles, Michigan.

Gentlemen:—Without obligation to me, please send me a copy of your latest Book of Designs.

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Address

THE HATFIELD

TIRE CARRIER AND TRUNK EQUIPMENT

for Hudson and Essex Cars

BRADLEY HI-SPEED PISTON PINS



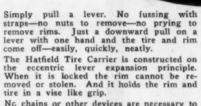
are made to factory and S. A. E. specifications of very best quality of steel. Ground to .0002 variation. Heat treated-thermostatically regulated - rounded ends, easy to insert.

All pins are sand blasted and free from burrings. Each Hi-Speed Pin is absolutely guaranteed. Any found defective, replaced without cost. Send for complete list and

We also manufacture Ford Sedan Running Board Trunks



The tire comes off with one operation-



No chains or other devices are necessary to prevent theft. The Hatfield Tire Carrier is thief-proof. THE HATFIELD TRUNK EQUIPMENT

is securely attached to the rear of the car-

is securely attached to the rear of the carand the trunk is detachable.
To remove—simply unlock a clasp at one
end. No straps.
The detachable feature is extremely handy—
when washing car—when touring—take the
trunk right off easily and quickly.
The tourist can take the trunk up to room
without unpacking.
The Hatfield Trunk is strong, durable,
water and dust-proof. State model, year and
type of car when ordering.
Send for full particulars and prices.
Hudson and Essex Dealers are cashing in
on these two Big Features.

Built Expressly for Hudson and Essex Cars

The Bradley Motor Products Co.

Fostoria, Ohio

Nothing Is Tight To This "Crowfoot" Model

Latest design in a family of wheel pullers. A two-arm or three-arm model as you require-a UNIVERSAL Wheel Puller.

Arms drop forged from high carbon steel, screw case hardened with inserted hard-ened tool-steel point. Guaranteed against

Made in 4 sizes. Other models, too. Equipped with LOCKING Arms.

Our 24-page folder tells all there is to know about pulling tools.

Crane Puller Co.

ARLINGTON, MASS.

SEMI-STEEL REPLACEMENT PISTONS



For replacement work after a rebore or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and várious oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio Southwestern Branch THE CARROLL CO. 2218 S. Harwood St., Dallas, Texas

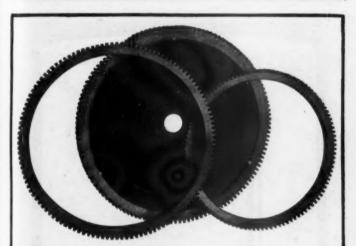


S AVE at least ONE-THIRD of your overhauling time. A ten-year old boy can raise the heaviest car in two minutes with this Model L MARTIN AUTO HOIST. Greatest time-saver yet, for meeting flat rates. Several models. Special models for filling stations—"oil and grease your car while you wait." Big money-making proposition. Time payment plan. Write us.



The T. A. Martin Equipment Co., Inc.

Bridgeport, Conn.



Save Your Fly Wheels

When a tooth breaks in your starter gear why buy a new fly wheel. Simply turn off the gear teeth and fit on a Meachem Steel Ring Gear. It is much cheaper and will outlast the car. Ten thousand in stock.

THE MEACHEM GEAR CORP'N.
Syracuse, N. Y.

Big sales and big profits!

Reid Air Springs meet conditions as they are. Their installation involves no cutting or drilling of the frame or defacing of the car.—They can be put on easily and quickly by the dealer who sells them.

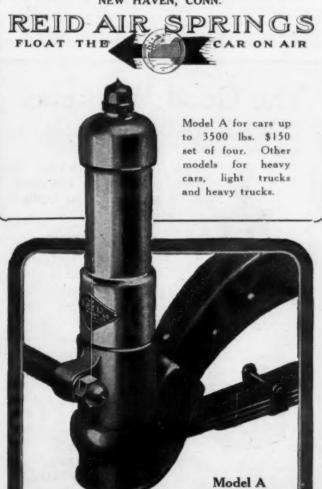
Once on—the velvet riding quality they give to the car, regardless of road bumps and hollows, is a revelation.

And they keep the car as stable as it was before.—There is no tendency to upset at sharp turns.

A device that gives an air of class and quality to the car—it goes big,—and because of liberal discounts its sale is rich in profit possibilities.

Distributors and Dealers-write today for details.

Reid Air Spring Company
NEW HAVEN, CONN.



CLAMP - ON

2 - Purpose Lamp No Holes to Bore

Bought readily by even the most economical FORD-OWNER because CLAMP-ON offers so many advantages. They have long wanted a trouble lamp; most want a dashlamp too. Here are both in one a trouble l lamp too. for \$2.50.

panel in ten minutes, and the buyer drives away, leaving a good profit with you.



CLAMP-ON

As a Dash Light

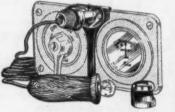
Sold Separate, \$1.50

Lights whole front compartment but nickeled brass shade prevents blinding driver. Switch on socket makes it independent of all other lights. All parts standard; makes lamps interchangeable.

CLAMP-ON

As a Trouble Lamp Sold Separate, \$1.50

Ten feet of cord reaches any part of car. With headlight bulb can also be used to light garage. Just remove shade, insert socket and set lamp in handle. No more fumbling on dark nights.



Write For Our Proposition-It's a Good One

THE BOYD CORPORATION, DEPT. C

2660 Washington Ave., St. Louis, Mo.
DISTRIBUTORS
Kane & Co., Forshay Bros., Tom M.
D. Broad St., 234 West 55th St., 2802 Will
elphis, Pa. New York, N. Y. Dallas

J. V. Kane & Co., 3137 No. Broad St., Philadelphia, Pa.

Tom M. Lamberth, 2802 Williams St., Dallas, Texas

Holliday-Fitzgerald Sales Co. 2822 Locust St., St. Louis. Mo.

Philadelphia, ra.

T. F. Dolan,

The Dolan

A Sledgehammer PISTONS

Any car has a hard enough road to travel when running properly. A spark plug that fails to fire not only lessens the power of the motor, but it's like a sledgehammer blow to the pistons, bearings, crankshaft and the whole mechanism.



The Good Workman Is Known By His Tools

The good workman is known by his tools. The good shop is gauged by its equipment.

Post yourself on all the latest ideas in acety-lene generation and tene generation and welding processes. Send today for the Smith cal-

Owners of Smith Welding and Acetylene Equipment find it easy to establish a reputation for good work and quick service. Smith Equipped Repair Shops are usually the most profitable because their operating costs lower.

> INVENTIONS INCORPORATED

> Minneapolis, Minn.



HEY SMOOTH OUT HE ROUGHEST ROAD



This "Silent Salesman"

will give Benzer Win-deflectors prominence in your store. This stand sent Free with your order for 3 sets. Write your jobber to-day, he has them.



A Buy That Can't Be Beat!

BENZER WINDEFLECTORS

At this amazingly low price, Benzer Windeflectors will sell quickly and often. Satisfaction for the buyer, and big profits for you.

Backed by our guarantee, they must make good—and they do. Constructed of finest glass, ¼ inch thick, with a half-inch bevel. Scientifically designed to deflect all dust, rain, snow and wind. Metal supporting arms and clamps are made of highest grade solid brass, heavily nickelled.

Don't pass this by! Order them today!

Jobbers Everywhere Sell Benzer Products.

THE BENZER CORPORATION

Myrtle, Cooper and Webster Aves.

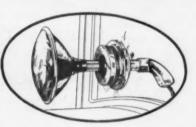
Brooklyn

New York





Over 6000 sold in one city alone first nine months on market. The fastest selling accessory ever made.

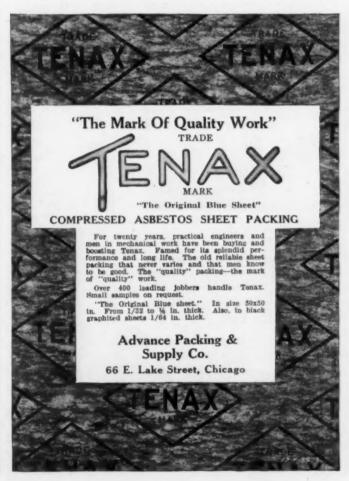


Big profits and quick sales make this the most desirable accessory you ever handled. Only three sales a day make you a gross profit of over \$4000 a year. Every motorist wants one the minute he sees it. Operates THRU the windshield. Easily installed. Self advertising. Thoroughly guaranteed. Adds greatly to the attractiveness of any car.

> For full particulars dealers should write for Folder D.

THE FLOYD CLYMER MFG. CO.

Denver, Colorado



Middletow

Even freezing will not burst it!

The brass honeycomb core of the Atlas Radiator is flexible— it expands as the water freezes, which eliminates the danger of bursting.

Furthermore, the Atlas is bet-ter protected against over-heat-ing in summer.

Its flattened tube construction gives it three times the water capacity of the tubular type and these tubes have four times the cooling surface.

A more efficient Radiator—it is also a stronger one.

In its patented construction a heavy steel bar runs across the rear face and this bar is formed integral with the bracket sup-ports and radiator sides.

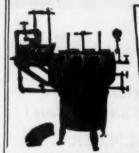
Whatever happens the Atlas keeps its true shape.

Made for all Fords and beautifully finished—the Atlas offers a
big dealer opportunity.
The discounts are
right. Write today.

> Steidle Mfg. Co. Cincinnati Ohio

ATLAS Radiators for FORDS

"The Radiator with a Backbone"



The Standard Vulcanizer Equipment for Repair Shop Use

A complete line, covering every requirement of the trade.

-Vulcanizers, Retreaders, Tube Plates, Steam Boilers, Tools, etc. Write today for descriptive literature.

THE AKRON RUBBER MOLD & MACHINE CO.

919 Sweitzer Ave., Akron, Ohlo



For Steering Wheels

(Price \$10.00)

All parts made of case hardened
steel which cannot be sawed,
filed or chiseled. No keys. Combination works by touch in dark.
Simple, unforgettable, unduplicated. In handlest position
for driver. Good profits in selling all Safe-T-Locks. Get the
full line. Write for complete
literature.

Chas. R. Morse Mir. Co.

Ilterature.

Chas. R. Morse Mfg. Co.
24 N. Ada St., Chicago, III.
Sales Representatives
Davis-Palmer Co.
4750 Sheridan Rd., Chicago

Cleans BOTH Sides of Glass



Rain—fog—snow or mist has no terrors for the Jiffy owner; he always has a clean windshield. BOTH sides of the glass are cleaned and dried in one sweep across.

Jiffy is made of aluminum and rubber—with tempered at e e l spring. No acrows or brackets. No rattle, easily installed.

Quick sales and rapid

Quick sales and rapid turnover are assured. The details will interest you. So will the dis-

The La Vietes Mfg. Co., Inc. New Haven Conn. THEN ALL advertisers demand their money's worth, all publications will provide circulation reports verified by the Audit Bureau

It is one of the mysteries of the advertising world that while all manufacturers demand verification of weight and quality in the material purchased, some of them still buy advertising space without knowing what they are paying for.

Such advertisers, however, are now exceptional. Most of them demand verified A. B. C. circulation statements before placing contracts.

In the case of Motor Age, the demand is immediately met.

It is a member of the Audit Bureau of Circulations.



"MODIFIED VAPOR"

SYCLO

Price

\$7.50

The Ford owner wants a smoother and more economical motor with PLENTY of POWER, and no over-heating in summer.

His problem is to find the right kind of a vaporizer.

THE CYCLO "DYNAMIC" HOT-SPOT For Fords

at last provides the true solution of this problem with its remarkably simple and effective method of heat control by

vacuum.

25 to 30 miles per gallon is the rule rather than the exception among CYCLO users. Absolute satisfaction is guaranteed.

Ask about our "Rapid Transit" selling plan.

Cyclo Manifold Company, High & Chestnut, Akron, Ohio

HARRIS OILS GREASES

In a class by themselves

Lubrication is without question one of the most vital factors in automobile maintenance. One sure way to gain the good will and confidence of your customers is to advise them to use Harris Oils. After they have used Harris Oils a short while, they will wonder why you didn't tell them sooner. For when it comes to a question of perfect lubrication, Harris Oils are in a class by themselves.



"America's Leading Lubricants"

Copyright AWHOCO 1921

A. W. Harris Oil Co.

Providence, R. I.

Chicago, Ill.

Dealers-Write for sales plan.





The Ultimate Way

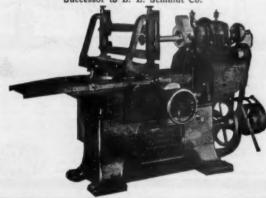
Wet grinding, as made possible by the Micro Internal Grinder, is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.



The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

If you're going to get a grinder, get the kind that will pay you biggest returns. Our bulletin gives full information—send for it.

MICRO MACHINE COMPANY, Bettendorf, Iowa





The Bearings Company of America



Your present Thrust Bearings sizes duplicated Thrust Ball Bearings made to your B/P's. Quotations made promptly on all inquiries.



THE BEARINGS COMPANY OF AMERICA, Lancaster, Pa. Western Sales Office, 1012 Ford Bldg., Detroit, Mich.

Get This "Pioneer" Garage Special



Electric Drill and Valve Grinder

Greatest time and money saver, as well as money maker, for your shop-

"It Will Do The Work"

Louisville Electric Mfg. Co.

Incorporated Louisville, Ky., U. S. A. C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

TURNER (T) QUALITY

GUARANTEED

Axle Shafts Propeller Shafts Pinion Shafts Pump Shafts

Spring Shackle Bolts Piston Pins Fan Bolts Spindle Bolts

Buick Valve Lift Assembly with Guide for Passenger Cars and Trucks Sold Thru. The Jobbers

The Turner Machine & Mfg. Co., Kansas City, Mo.

ALUMINUM ALLOY. NON EXPANDING



How to Eliminate Piston Slap

Piston Slap is a common and vexatious cause of engine trouble which in the past has bothered most car owners.

But it can now be eliminated.

With the E. C. L. Aluminum Alloy Non-Expanding Piston. E. C. L. Pistons may be fitted with a closer degree of clearance than cast iron pistons. They reduce the consumption of gas and oll—increase power and speed and eliminate spark knocks.

Let us tell you more about this remarkable piston. Write for the details today.

E. C. LONG

Main Office and Factory 4834 Beaubein Street

Detroit, Mich.

The Shop's Greatest Need CHNSON Combination Bench Furnace

FOR SOLDERING FOR HEAT-TREATING FOR METAL MELTING

For many other odd jobs. Requires No Forced Air Blast or Blower. Just connect to city gas pressure.

Write for descriptive literature of Gas Appliances.

Codar Rapids DO 10WA



"AUTEX"

EXTENSION REEL

For Electric Lights.

Fully approved by the National Board of Underwriters.

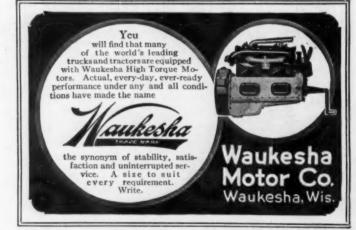
Patented: Oct. 1915, Jan. 1917 and ec. 1920.

Patented: Oct. 1915, Jan. 1917 and Dec. 1920.

The "AUTEX" is also being extensively used by many of our largest industrial plants for portable drill and other electrical unit extensions.

Made in two sizes—for 25 ft. and 50 ft. reinforced cord. Automatically winds and locks at any desired point. Its swivel-joint feature enables the light to be taken in any direction from the reel. Write for particulars.

The Cincinnati Specialty Mfg. Co., Inc.





MR. RADIATOR REPAIRMAN



Make your own radiator cores and save 20% to 50% of their cost, give your customers quick service and a better core for less No need to carry large money. stocks of cores, and no damage in shipping. Increase your vol-ume of business. Send for illus-trated booklet describing our radiator core equipment. We supply small shops with formed core stock and the small fixtures to build cores complete. for information to

Radiator Engineering Co.

626 Nesslewood Ave.

Toledo, Ohio



Big profits for garages, repair shops and tire men with the Gee-Bee Tire and Tube Vulcanizer. Best and most reliable on the market. Few parts—nothing to get out of order. Patented automatic heat control. Cost less to operate than gas or gasoline. Made in all standard sizes. Low in price. Write for full particulars.

CHASE MFG. CO., 3220 Morgan St., St. Louis, Mo. Sue essors to Gwynn-Bacon Vulcanizer Co.

B EXPANSION HAND REAMER

BLADES CUT AT DIFFERENT ANGLES

Each successive blade cuts AT A DIFFER-ENT ANGLE from the one

No CHATTER, no DIGGING INeven in keyed holes

TWICE the expansion of others. All sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN REAMER-Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.

Manchester, Conn.

ARANITE CABI Best for Automotive Work

carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD IF IT'S PARANITE IT'S RIGHT

Quality jobbers handle quality cable—that's PARANITE.

Indiana Rubber & Insulated Wire Co.

210 S. Desplaines St., Chicago Factory and General Offices-Jonesbore, Ind.



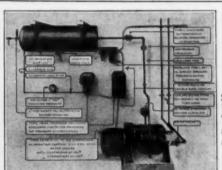
An improved Magneto Plug for the Ford. Makes cleaning easier and quicker.
The flange screws permanently on to transmission, using old screw holes. The Plug screws into flange like a spark plug. No oil leaks. Guaranted. A great dealer proposition. Sells fast and the discounts are big. Get busy.
Distributors and Dealers, write for details.

List Price, \$1.00.

The Hazle Specialty Co.
Hazleton Penna.

E-Z-2-KI FORD MAGNETO PLUG

for details.



Air Compressor Units

Suitable for Giant Pneumatic Truck Tires, Air Tools, and General Garage Purposes.

Write for Complete Information

ALLIS-CHALMERS MANUFACTURING CO. MILWAUREE, WIS., U. S. A.

Air-Tight Steel Tank Co. PITTSBURGH, PA.



Tanks-High Pressure and Storage-Regular and Special to Order — Brazed or Welded — Gasoline Storage Tanks and Pumps—Structural and Machine Work. Send us your inquiries or specifications.





Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics Kokomo Two-Grip Cords Kokomo Everlaster Red Tubes Kokomo Standard Gray Tubes

KOKOMO RUBBER CO., Kokomo, Indiana 131 South Main St.

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MILO B. STEVENS & CO., Patent Attorneys 338A Monadnock Block, Chleage, III. 600 Barrister Bidg., Washington, D. C. ESTABLISHED 1864



FOLBERTH Automatic WINDSHIELD CLEANER

A good profit for you in this wonderful, fast-selling necessity. Ask your jobber or write.
AUTO SPECIALTY CO., CLEVELAND



Small spring absorbs light shocks and prevents sharp re-coil from heavy shocks. Large spring absorbs heavy shocks. Remarkable flexibility and smoothness of action is result. This shock absorber has been a big success for many years. Your jobber can supply you for any car.

Shock Absorber Co., 4143-45-47 W. Kinzle St., Chlcago



FOLBERTH

STEP ON THE GAS

with a

Williams Accelerator for FORD CARS

WILLIAMS BROS. AIRCRAFT CORP. San Francisco



F-40 For Fords

and Chevrolets. A thrust bearing for the differential. Makes 'em push easier, climb better, dodge axle trouble.

Bantam Ball Bearing Co., Bantam, Conn.



DOUBLE YOUR OIL SALES

Install one or more units of the Correct Measure Motor Oil Display
Pump on your curb. "Make him think of oil." This pump is handsome in design, sturdy, holds 12 gallons. Empty weight 65 lbs. Low
center of gravity. Can be rolled to curb in morning and back indoors
at night. Delivers ½ gal. in 12 seconds. Price \$45 per unit.

Write for details.



The CO

from \$1,195 to \$2,165

THE COURIER MOTORS COMPANY SANDUSKY, OHIO

GRINDING MACHINES



Cylinder — Internal — Surface Grinders — Magnetic Chucks

THE HEALD MACHINE COMPANY

61 New Bond St., Worcester, Mass.

Branches in Various Cities



THE HYDRAULIC CONTROL

More than a Shock Absorber because it fluid-cushions all movements between the body and the chassis—gives a new experience in riding comfort.

Good distribution territory is still to be allotted. For information write to

AUTO SPRING CONTROL CO.



COMPLETE PISTON SERVICE

A ring for every purpose—Spiral Cut, Oiless and StepSet—and a complete line of semi-steel Replacement Pistons and high-grade Piston Pins. Write for details.

INLAND PRODUCTS CO., INC.

Main Office and Factory

St. Louis, U. S. A.



Specify "R. S. P. VALVES"

Special Alloy or Chrome Nickel

Standard and Oversize-Forged in one piece

RICH STEEL PRODUCTS CO.

Los Angeles, Cal.

Battle Creek, Mich.



Most durable in operation. Sells on sight.

Berill & Co., Buffalo, N. Y.



SEE PAGE 5

Beacon Visible Gasoline System

Double check. Pay only for the gas you get. Makes satisfied customers. Write for catalogue.

BEACON VISIBLE PUMP CO.

Louisville,







NO-LEAK-O PISTON RINGS

Every Time We Sell a Car We Make a Friend



NO-LEAK-O PISTON RINGS

Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilsEALing" groove—
dealers everywhere. Their "oilsEALing" groove—
out only in No-Leak-O—packs an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O by teaching the motorist the lesson of more milesge on less oil and gas.

It will pay you to stock No-Leak-O at onco.

Price 50c and up.

Price 50c and up.

RING CO., Dept. T-57, Baltimore, Md.

COMPLETE INFORMATION

On Automotive Cables, Description-Sizes-Diameters, Classified as to Service-Fully Illustrated Will Be Found in the Current Issue of

Automotive Equipment Association Catalogue. The Automobile Trade Directory. Chilton Automobile Directory.

The Jackard Electric Company

WARREN, OHIO



STOPS GUESSING

More

dicates definitely direction driver
dis to turn. Signals at both
front and rear of open
or closed cars. Meets requirements of all State
laws. Attractive — Durable — Effective.
Dealers - Jobbers, write
for details and territory.
The Motor Products Co.
Norwalk. Ohio

Power

Fuel

ERNATIONA MOTOR TRUCKS for low-cost hauling

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck Some territory is still open for dealers.

International Harvester Company of America (Incorporated)
Chicago, U. S. A.



Makes headlight glare, sun glare, road glare and snow glare harmless. Driver looks through it—vision not obstructed. Made of sapphire-blue Belgian optical glass. Two models for open and closed cars. Frice, \$3.50. Order through your jobber. Distributors wanted.

DETRO SALES SERVICE COMPANY, 1647 Penobscot Bidg., Detroit



"Bull Dog" Foot Accelerators for Fords

RUBBER COVERED PEDAL -MAT BINDER. NON-SLIP FOOT REST

The W. H. Thomas Mfg. Co.

Degt. A

Sponcer, lowa
Sales Representatives
The Fulton Co., Milwaukee, Wis.

Zenith Carburetor Company, Detroit, Mich.



SOCKETS WILL NOT BREAK

This new socket wrench is something every mechanic has long wanted. Made from selected stock, specially heat-treated and hardened. No other sockets are quite so strong, no other ratchet quite so well made, no other universal quite the same. Care and quality sevident in every unit. Exceptional facilities allows marketing at an attractive price. Write for guarantee.

THE EASTERN MACHINE SCREW CORPORATION
10-20 Burcluy St., New Haven, Conn.



The Aristocrats of Motordom

7 Models-Open and Closed

Built Car Distributors in principal cities. Open territory now heing closed.

Kissel Motor Car Co. Hartford, Wis.



Portable Re-borer Engine & Mfg. Co.

Crinder Port Washington, Wis.



Wedge-Rite piston rings are 3-piece rings following the best engineering practice. The patented wedge takes up the wear, keeping the groove and cylinder wall tight against oil and compression leakage. WedgeRite Piston Rings are made from the best individual castings. WedgetPier Plattsburgh, N. Y.

A LITTLE SELF CONTAINED MACHINE SHOP THE FRANKLIN

Universal Valve and Cutter Grinder

The biggest little tool you can install in your shop. Requires no countershafting or pulleys. Grinds valves, reamers and cutter tools. Is equipped with a flexible shaft for reaching out-of-the-way places with a grinding wheel or wire brush, and can be hooked up for drilling.

Don't spend a lot of money for expensive equipment until you have investigated this handy, efficient and reasonably priced tool. Your jobber will tell you, or write us direct.

FRANKLIN MACHINE & TOOL CO. Springfield, Mass.

Self-Aligning ROLLER BEARING

THE SHAFER BEARING CORPORATION 6501 W. Grand Avenue, Chicago



Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.

JENKINS VULCAN SPRING CO.
Factory: RICHMOND, INDIANA
BRANCHES: Boston, Mass., 819 Boylston St.; Dallas, Tex., 2216-18 Commerce St.; St. Louis, Mo., Main and Cedar Sts.; San Francisco, Cal., 1035-Polk St.

DIAL GAUGES

B. C. AMES COMPANY Waltham, Mass.



THE VALUE of TODAY

EARL MOTORS, INC.

MOTOR CAR Jackson,

Michigan

GRINDING **MACHINES**

LANDIS

BORING **MACHINES**

LANDIS TOOL COMPANY

WAYNESBORO, PA.

NEW YORK OFFICE: 51 Chambers St.

BU TRADE MARK

RADIATOR

-Safer-More Profitable

THE BURNLEY BATTERY & MANUPACTURING CO. Northeast, Pa.



SAY "W. & C."

and Your Jobber Will Give You the Most Successful Time-Tried Shock Absorber for Fords W. & C. Shock Absorbers Sell

P. H. WEBBER COMPANY

Hoopeston

Prompt shipment, highest grade materials, precision accuracy to closest dimensions and unexcelled workmanship. Send for specification and price lists—they make pin and valve buying simple. THE TRINDL CO., 2917 Wabash Avenue, Chicago, Ill. Big profits made possible

in your own shop

and Valves

You can grind cylinders with the AUTO-HONE without dismantling the motor or removing cylinder block. Send today for full particulars.

THE AUTO-HONE CO.,
Buffalo, N. Y.

Piston Pins

Send Us Your Armature Repair Work

ARMATURES REWOUND \$2.00



MOST ANY TWO UNIT GENERATOR ARMATURE \$5.00

ALL WORK GUARANTEED-WRITE FOR PRICE LIST U. S. AUTO SUPPLY CO., 3845-49 S. WABASH AVE., CHICAGO

Fly-Wheel GearBands

Huetter Machine & Tool Co.

545 Kentucky Ave.

Indianapolis, Ind.



INENDOLL EXHAUST

Warms any car, open or closed.
No odor, smoke, dust or noise,
Easily installed, operated and cleaned,
Sells quickly. Write for our attractive trade
proposition.

proposition.

THE NORWALK AUTO PARTS COMPANY Norwalk, Ohio



AIRCO IGNITION GAUGE

The Original Ignition Gauge Utilizing Neon
Instantly locates spark plug and other ignition troubles.
Place it alongside the oil can for convenience. Test the
spark plugs every time you oil the car. The motor will
purr its appreciation.
\$1.00 with Clip and Screws
AIR REDUCTION SALES COMPANY
342 Madison Ave., New York, N. Y.
Pioneer in commercializing the elements of the air.



GUAY CLUTCH DISC & PLATE

For Dodge Bros. Cars

Models for other cars will be announced shortly. Extraordinary flexibility and durability are gained by passing every thread of asbestos over and under the steel flugers at a given length of % inch. Thus all strings are under the same measured spring tension. Steel and asbestos only materials used. No wires or rivets to cause uneven wear. Price of complete set, \$12.00, Good discounts to trade. Write for complete details.

JOHN C. HOOF & COMPANY

Mfg. Division 159 W. Illinois St., Chicago







Electrical Testing Equipment
Universal Test Benches, Growlers, Magnetizers, etc.
Write today for Bulletin M-18.

4358 W. Roosevelt Rd., Chicago, Ill., U.S.A.





THE VALVE GRINDER **EVERY** SHOP NEEDS

Ten Days' Free Trial

General Tool & Equipment Co. Distributors

70 W. Monroe

Chicago, Ill.

THE GRAND PRIX CAR

DUESENBERG

Original Straight Eight

Duesenberg Automobile & Motors Co., Inc., Indianapolis

U. S. ASBESTOS Also Durabestos & Motobestos BRAKE LINING

Unequalled in its Performance

United States Ashestos Co.

Manheim, Pa.



CARTER OIL GAUGES

For Ford, Chevrolet and Dodge—Only \$3.75 Buick, Oakland and Chandler—\$5.00

ACCURATE—EASY TO INSTALL—GUARANTEED

Screw gauge to dash or instrument board; connect copper tube with elbow in place of lower petcock. No oil passes thru tube or gauge. No moving parts, floats or plungers. Easy to sell; easy to install. Big money-makers.

Order from your jobber or write for discounts.

Carter Motor Accessories, Inc., 388 Pearl St., Buffalo, N. Y.



Automatic Control. Automatic Release.
Start against no load.
Style E-2: 2¾ cu. ft. per minute.
140 lb. pressure. Tank 16x36, 32 gallon.
25 ft. hose with air chuck. ½ H. P. Motor.

The Lucas Pump & Tool Co.

430 Valley St.

Dayton, O.

GENERAL ASBESTOS & RUBBER COMPANY



ASBESTOS PRODUCTS

Branches

New York Chicago Pittsb Main Office and Factories: Charleston, S. C.

Tires and Tubes

Empire Tire & Rubber Corp



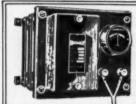
Sparton speak!

Special display beard given free with initial order for six. Write for complete particulars. The Sparks-Withington Co., Jackson, Michigan

WARNER GEAR COMPANY MUNCIE, INDIANA



CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS



Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for

THE HOMCHARGER

BIG PROFITS. WRITE NOW.

The Automatic Electrical Devices Co. 122 West 3rd St. Cincinnati, Ohio

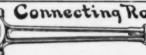


JACOBS CHUCKS ARE STANDARD EQUIPMENT ON THE BEST PORTABLE DRILLS.

Write for circular, "A Jacobs Chuck for Every Purpose."

The Jacobs Manufacturing Co.

Hartford



Connecting Rods Rebabbitted

and rebuilt with new bolts and nuts, laminated shims, new pin

Information and prices on request, bushings.

WATKINS MFG. COMPANY
Ward Street, Wichida, Kannas INDIANA WATKINS MFG. CO.

ALL-STATES REBABBITTING SERVICE

WATKINS MFG. COMPANY 203 Wyorning Street, Syracuse, New York





TEST YOUR BATTERIES

by the Chart Method. Something New. Send for free booklet, today.



Electric Controlling Apparatus

281 Greenfield Ave., Milwaukee, Wis.

WEL-EVER CONTROL PISTON RINGS

Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, pre-vent spark plus fouling and reduce carbon for-mation.

Write for interesting circular on oil pumping and details about this fast selling piston ring.

THE WELEVER PISTON RING CO. 1713-15 Canton St. Toledo, Ohio





ROBERT BOSCH MAGNETO CO., INC. OTTO HEINS, Pres., 123 W. 64th St., New Yo



stall Logan Ring

Kauffman Metal Products Co Bellefontaine, Ohio

GET ACQUAINTED WITH

GASKO CEMENT

It's Better Than Shellac for Motor Gaskets Send 25c in stamps for Trial Tube-Today.

VAN SICKLE MFG. CO., Lincoln, Nebr.



Kant-Skore

WEIGH LIGHTEST . FIT TIGHTEST Regrinders, Repair Men, Dealers Write for literature, price list and liberal proposition. Prompt service and delivery on all standard and special oversizes up to .065. Over 600 models.

THE KANT-SKORE PISTON CO., Cincinnati, Ohio, and Kansas City



ALVORD QUALITY TOOLS



Taps, Dies, Cutters, Drills, Reamers Send for Catalog
ALVORD REAMER & TOOL COMPANY Millersburg, Pa.

51-6/10 MILES ON A GALLON OF GAS

It is the official world's record-breaking test with Ford Touring car. The new 1922 Stromberg Carburetor and Hot Spot did it—made this marvelous mileage possible.

Tens of thousands of Ford owners are now obtaining more miles on a gallon—quicker getaway—easier starting—increased power and speed—all because of having their cars so equipped.

Live dealers are requested to write for facts pertaining to territory.

Stromberg Motor Devices Co. 64 E. Twenty-Fifth St. Dept. 27

Chicago, Ill.

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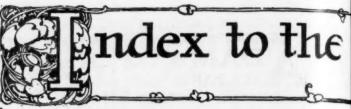
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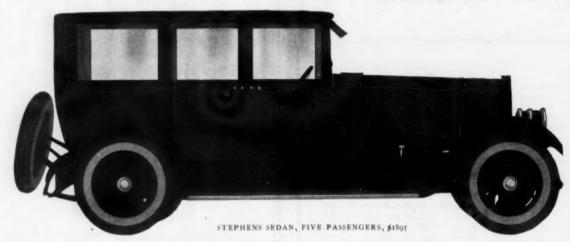
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GILL MANUFACTURING COMPANY

8300 South Chicago Avenue, Chicago

Canadian Factory—415 King St. W. (Brown Engineering Co.), Toronto Sole Canadian Distributor—Canadian General Electric Company, Limited Export—American Steel Export Co., Woolworth Building, New York City

